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WHOLESALE FOOD DISTRIBUTION FACILITIES

for Springfield, Mass.

Marketing Research Report No. 728

Agricultural Research Service
U.S. DEPARTMENT OF AGRICULTURE

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SUMMARY

A new wholesale food distribution center to replace inefficient, outmoded, and poorly located markets in Springfield, Mass., would save 59 independent dealers, of the 67 who need better facilities, an estimated $958,676. These savings would come from lower costs for cartage, handling, interdealer transfers, and spoilage, deterioration, breakage, and shrinkage. The highest saving, $834,026, would be in handling; laborsaving equipment could be used advantageously in the new center. Other unmeasurable benefits would accrue to dealers, buyers, railroads, truckers, farmers, and others.

The food center should include wholesale marketing facilities for fruits and vegetables, meat and related products, dairy products and eggs, and groceries.

At the time this study was made, 105 independent wholesalers and 6 food-chain organizations received and distributed about 624,000 tons of foods through the marketing channels of the city. Of this amount, 331,000 tons, 53 percent, was consumed in Springfield, and 293,000 tons was transported to areas outside the city.

To accommodate 67 independent wholesalers who badly need more adequate facilities and the farmers who sell in Springfield's wholesale markets, the following are suggested: 4 multiple-occupancy buildings, containing 97 store units with 342,405 square feet of space, for the 59 dealers who received 155,000 tons of food; single-occupancy buildings for 2 large-volume grocery wholesalers who will need about 48,000 square feet of first-floor space; a refrigerated warehouse for 6 wholesalers who handle frozen foods and other food specialties; and a farmers' market with 50 covered stalls. In addition, a food-chain warehouse, containing about 48,000 square feet, and a service area are suggested.

These facilities, with space for future expansion, would require about 86 acres of land. Three city sites were evaluated in detail: The Gulf site, Hampden-Pynchon Park site, and Cottage Street north. Advantages and disadvantages of each are outlined.

The total investment cost of land and facilities, using the Gulf site for illustration, would be $3,639,300 for the 4 multiple-occupancy buildings, $70,100 for the farmers' market area, $748,300 for the 2 single-occupancy grocery buildings, $624,500 for the food-chain warehouse, $2,158,300 for a refrigerated warehouse, $428,900 for the service facilities, and $202,000 for 29.8 acres of land reserved for allied industry. This amounts to $7,871,400 for the food center.

It is concluded that the proposed food center is economically feasible if (1) it is built at a convenient location, (2) suitable facilities are constructed, (3) all planning is in accordance with a master plan, (4) plans are coordinated with city objectives, and (5) an effective sponsoring group is established to carry out the project.

WHOLESALE FOOD DISTRIBUTION FACILITIES FOR SPRINGFIELD, MASS.

By Paul J. Hanlon and W. Edward Blackmore, Transportation and Facilities Research Division, Agricultural Research Service, and Donald R. Marion, University of Massachusetts

BACKGROUND OF THE STUDY

At the request of the Joint Civic Agencies of Springfield, the University of Massachusetts made a brief examination of the Springfield wholesale food market in the summer of 1963. The University of Massachusetts, Department of Agricultural and Food Economics, tentatively concluded that if a new market were to be built, it should include all food wholesalers and not be limited to meat and produce, as in neighboring regional markets. This preliminary study determined that building a market for all food wholesalers was feasible, but that further study was needed.

Mayor Ryan then requested the Transportation and Facilities Research Division, Agricultural Research Service, to develop plans for a wholesale food distribution center for the city, determine the facilities required, and estimate the cost involved. The imminent encroachment of Interstate Route 91 upon the market area was a factor in this request.

For many years the city officials have realized that the old market areas on Columbus Avenue and Lyman Street were deteriorating and falling behind the times. Civic and business interests were given added incentive toward fostering a new market by the north-south express route being constructed which would intersect the east-west Massachusetts Turnpike. They expect to make Springfield a hub for distribution to a considerable part of New England, particularly the western Massachusetts region. A map of the Springfield market area is shown in figure 1.

This study was begun in the summer of 1963 by members of the Transportation and Facilities Research Division and members of the faculty of the University of Massachusetts.

Data in this report were obtained with the assistance of the City Planning Board and the City Community Renewal Office, and by personal interviews and observations and the examination of records of various food handling firms. Information was obtained from retail buyers and from truckers hauling to and from these firms. Other data and statistics were supplied by officials of the city, State, and Federal governments, the railroads, and the labor organizations. The data relating to volume of commodities handled and costs are based on the calendar year 1962, which were the latest available at the time the study was begun. Unless otherwise stated, the 1962 data are used throughout the report.

The study had the following objectives:

- To analyze the food marketing situation and to determine the adequacy of the marketing facilities in Springfield in the light of present and future needs.
- To develop plans and designs for facilities and consider sites that would be adequate to provide the most efficient means of distributing Springfield's food supplies.
- To estimate costs of facility construction, possible operating expenses, and self-liquidating potentials.
- To estimate probable savings and other benefits from any suggested improvements.

FOOD MARKETING IN SPRINGFIELD

For the purpose of this report the "Springfield area" consists of the city of Springfield, Chicopee, part of Holyoke, West Springfield, Agawam, Longmeadow, East Longmeadow, Wilbraham, and Ludlow (fig. 1). This area is greater Springfield, which is the concentrated part of the enlarged city area. The area had a population of about 345,000 in 1960. The area's economy is primarily industrial. Rural land is devoted to the production of vegetables, fruits, including large

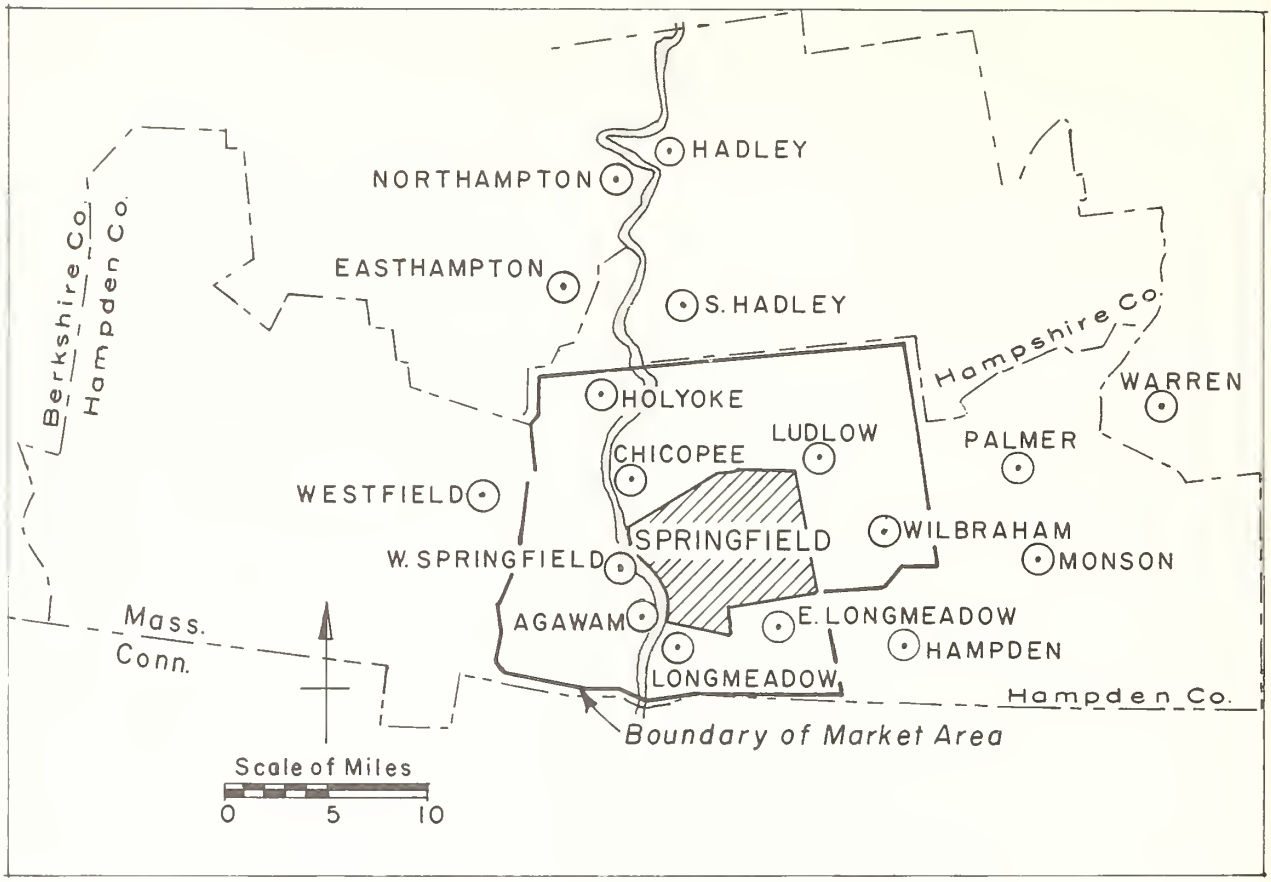

FIGURE 1.—Map of the Springfield market study area.

apple orchards, dairying, and recreation. Springfield is the primary urban and commercial center for western Massachusetts from the border of Connecticut northward throughout the Connecticut River Valley into Vermont and New Hampshire.

Because Springfield possesses an excellent north-south route, Interstate 91, as well as the Massachusetts Turnpike, the city's receivers, manufacturers, and distributors can expand the effective trading area by reaching out into many parts of New England and the Middle Atlantic States. The immediate food distribution area is a three-county area, consisting of Hampden, in which metropolitan Springfield is located, Hampshire to the north, and Berkshire to the west. If food wholesalers go farther east, they enter a trading area in which Worcester and Boston hold a competitive advantage, and if the trading area is extended farther south, they enter an area where Hartford holds an advantage.

The two major wholesale food market areas in Springfield consist of facilities on Columbus Avenue and on or near Lyman Street. Since there are only three fruit and vegetable dealers and one meat dealer on Columbus Avenue, the Columbus Avenue market and the Lyman Street market have been joined, for purposes of this report, into one marketing area defined as the Columbus-Lyman market. Other wholesale food facilities dispersed around the city have been grouped as "other Springfield."

One national food chain had a warehouse in Springfield. However, five other food chains having warehouses outside Springfield and distributing within the city maintained storage facilities, usually connected with their retail stores. They occasionally used public warehouse space in the city.

All operators were classified into one of the following groups: (1) Fresh fruits and vegetables, (2) meat and related products, including poultry, frozen foods, and fish, (3) dairy products and eggs, and (4) groceries. Volume of product handled, kind of business, amount of space used, and other pertinent information were obtained from each dealer.

Number of Dealers

The number of wholesale dealers, by type of commodity handled, and the market area of operation are shown in table 1. Sixty-two of the 105

independent dealers operated from facilities located in "other Springfield" areas, 35 were located in the Columbus-Lyman area, and 8 operated from public warehouses.

TABLE 1.—*Number of independent wholesale dealers and food-chain organizations, by type of commodity and market area, Springfield, 1962*

Type of handler or market area	Fruits and vegetables	Meat and related products	Dairy products and eggs	Groceries	Total
	Number	*Number*	*Number*	*Number*	*Number*
Columbus-Lyman market area	20	8	3	4	35
Other Springfield	12	16	12	22	62
Dealers in public warehouses [1]	2	2	2	2	8
Subtotal	34	26	17	28	105
Food-chain organizations	(2)	(2)	(2)	(2)	6
Total	34	26	17	28	111

[1] Independent wholesale dealers who operated from public warehouse facilities.
[2] Each of the 6 food-chain organizations handled all 4 types of food.

Volume of Receipts

Wholesale handlers in Springfield received 623,994 tons of foods in 1962. Of this amount, 430,105 tons, including 52,419 tons of local origin, came in by truck and 193,889 tons arrived by rail (table 2).

Twenty-eight percent of all receipts were unloaded in the Columbus-Lyman market area. Of these receipts, 67,282 tons came by rail and 108,400 tons by truck, including 42,990 tons of products arriving at the farmers' market or from processors in the city. Independent wholesale dealers in "other Springfield" areas handled 174,186 tons, of which 35,988 tons arrived by rail and 138,198 by truck. The 8 dealers who operated in public warehouses received 40,669 tons, and the food-chain organizations received 233,457 tons.

Fruits and Vegetables

Wholesale handlers received 122,917 tons of fruits and vegetables. Of this volume, about 26 percent arrived by rail and 74 percent by truck. The truck receipts included 7,450 tons that were sold through the farmers' market (table 2).

The independent dealers in the Columbus-Lyman market received 56 percent of the total. About 12,130 tons were unloaded at facilities in "other Springfield" markets, 10,874 tons at public warehouses, and 31,573 tons were received by food-chain organizations.

Meat and Related Products

The Springfield wholesale food handlers received 101,945 tons of meat and related products. Of this total, 48 percent were rail receipts, and 52 percent were truck receipts. The Columbus-Lyman market dealers received 52,929 tons, and the dealers in the "other Springfield" markets obtained 13,250 tons, which accounted for 65 percent of all receipts. The public warehouses handled 4,689 tons and the food-chain organizations 31,077 tons of the total received (table 2).

Dairy Products and Eggs

The 17 independent dealers and food-chain organizations that handled butter, margarine, cheese, and eggs received 48,420 tons of these products. Nine percent of the total arrived by rail, and the rest came in by truck (table 2). The receivers in the Columbus-Lyman market obtained 11,656 tons and the dealers in the "other Springfield" markets 13,711, which amounts to 52 percent of the total receipts. There were 9,805 tons received at the public warehouses, and 13,248 tons unloaded at the facilities of the food-chain organizations.

Groceries

The total receipts of groceries in Springfield amounted to 350,712 tons, 31 percent by rail, and 69 percent by truck (table 2). The Columbus-Lyman market received 42,757 tons and the "other Springfield" markets received 135,095 tons. The unloads at public warehouses amounted to 15,301 tons, and the receipts at the facilities of the food-chain organizations were 157,559 tons.

Sources of Supply

The commodites handled by wholesale food dealers in Springfield originated in 10 general areas of the country. The dealers' records were checked for the sources of their supplies. Table 3 shows the origin of the 624,000 tons of all foods received in Springfield. The sources most frequently named by wholesale food handlers in Springfield, in the order of importance, were the West and the Midwest, the South and the Eastern States (other than New York and the New England States), Boston, and western Massachusetts.

TABLE 2.—*Receipts of foods, by type of handler, market area, method of transportation, volume of local origin, and food group, Springfield, 1962*

Type of handler or market area and food group	Rail	Truck	Local origin [1]	Total
ALL FOODS				
Independent dealers:	*Tons*	*Tons*	*Tons*	*Tons*
Columbus-Lyman market	67, 282	108, 400	(42, 990)	175, 682
Other Springfield	35, 988	138, 198	(9, 429)	174, 186
Total	103, 270	246, 598	(52, 419)	349, 868
Dealers in public warehouses	13, 062	27, 607	0	40, 669
Food-chain organizations	77, 557	155, 900	0	233, 457
Total	193, 889	430, 105	(52, 419)	623, 994
FRUITS AND VEGETABLES				
Independent dealers:				
Columbus-Lyman market	18, 813	49, 527	(7, 450)	68, 340
Other Springfield	1, 608	10, 522	0	12, 130
Total	20, 421	60, 049	(7, 450)	80, 470
Dealers in public warehouses	1, 405	9, 469	0	10, 874
Food-chain organizations	10, 480	21, 093	0	31, 573
Total	32, 306	90, 611	(7, 450)	122, 917
MEAT AND RELATED PRODUCTS				
Independent dealers:				
Columbus-Lyman market	40, 093	12, 836	(3, 599)	52, 929
Other Springfield	1, 610	11, 640	0	13, 250
Total	41, 703	24, 476	(3, 599)	66, 179
Dealers in public warehouses	1, 563	3, 126	0	4, 689
Food-chain organizations	6, 128	24, 949	0	31, 077
Total	49, 394	52, 551	(3, 599)	101, 945
DAIRY PRODUCTS AND EGGS				
Independent dealers:				
Columbus-Lyman market	538	11, 118	(7, 407)	11, 656
Other Springfield	200	13, 511	(9, 429)	13, 711
Total	738	24, 629	(16, 836)	25, 367
Dealers in public warehouses	352	9, 453	0	9, 805
Food-chain organizations	3, 440	9, 808	0	13, 248
Total	4, 530	43, 890	(16, 836)	48, 420
GROCERIES				
Independent dealers:				
Columbus-Lyman market	7, 838	34, 919	(24, 534)	42, 757
Other Springfield	32, 570	102, 525	0	135, 095
Total	40, 408	137, 444	(24, 534)	177, 852
Dealers in public warehouses	9, 742	5, 559	0	15, 301
Food-chain organizations	57, 509	100, 050	0	157, 559
Total	107, 659	243, 053	(24, 534)	350, 712

[1] Local origin includes receipts at the farmers' market and from processors in the city.

TABLE 3.—*Sources of supply of food by commodity group, Springfield, 1962*

Source of supply	Fruits and vegetables	Meat and related products	Dairy products and eggs	Groceries	Total
	1,000 tons	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Western Massachusetts	28. 0	5. 6	11. 8	13. 7	59. 1
Boston	10. 0	8. 8	6. 2	35. 6	60. 6
Providence	0. 6	0. 6	0. 6	18. 1	19. 9
Hartford	5. 0	0. 6	1. 2	15. 6	22. 4
New Haven	0. 6	3. 1	1. 9	2. 5	8. 1
Other New England	6. 3	3. 7	4. 3	3. 1	17. 4
New York City area	19. 3	1. 9	2. 5	23. 7	47. 4
Albany	1. 3	3. 1	2. 5	6. 2	13. 1
West and Midwest [1]	30. 0	66. 4	13. 1	169. 3	278. 8
South and East [2]	21. 8	8. 1	4. 3	62. 9	97. 1
Total	122. 9	101. 9	48. 4	350. 7	623. 9

[1] West—California, Arizona, and Texas. Midwest—Nebraska, Kansas, Oklahoma, Iowa, Missouri, Arkansas, Louisiana, Wisconsin, Illinois, Indiana, and Ohio.

[2] South—Florida, Georgia, Alabama, and Mississippi. East—Pennsylvania, New Jersey, Maryland, Virginia, North Carolina, and South Carolina.

Description of Present Wholesale Market Facilities

This chapter describes the two major wholesale food marketing areas mentioned in an earlier chapter, and the facilities in other parts of Springfield that are important in the wholesale handling of foods.

Columbus-Lyman Market

The Columbus Avenue market is in a railroad terminal building. This antiquated facility houses three fruit and vegetable dealers' and one meat dealer's wholesale operations. Parking, other than for loading, is not allowed. The team tracks are overgrown with weeds. The city traffic is heavy and must be kept in motion by traffic officers, allowing buyers little time for shopping. The meat facility finds it easier to handle most of its volume through in-transit delivery to customers, instead of receiving the products at the facility and distributing them from there.

The terminal building housing the four food facilities is in the path of the new north-south expressway, Route 91, and is scheduled for demolition.

The carlot receivers in the Columbus Avenue market supply jobbers in the Lyman Street market area, which is about 4 blocks away.

A few associated industries were in the Columbus Avenue market area, including team tracks and four parking lots (fig. 2). The Columbus Avenue market contains about 4 acres of land.

The Lyman Street market, which contains about 25 acres, is the most important market in the city in number of dealers and its service to the city of Springfield. It is in the midst of the downtown business district. It was a place of great business activity in the days of the horse-drawn vehicles, but is now out of date. The assessed value of land and buildings on Lyman Street is estimated at $4.65 per square foot. Approximately one-third, or 31, of the independent wholesale dealers in the city are located in the area. It is bounded on the east by Worthington Street, on the south by Dwight and Chestnut Streets, on the west by Liberty Street, and the north by Autumn Street (fig. 3).

Located on one side of Lyman Street in facilities paralleling the Boston and Albany railroad tracks are seven carlot receivers, including four meat dealers and one dairy, one grocery, and one fruit and vegetable dealer. On the other side of the street are mostly jobbers of fruits and vegetables.

Including the wholesale facilities on the fringe of the market, there are 17 fruit and vegetable, 7 meat, 3 dairy products and eggs, and 4 grocery facilities in the market. In addition, there are 36 allied industries, 22 parking lots, and 2 public refrigerated warehouses in the general area.

Most of the Lyman Street market buildings that are occupied by wholesale food dealers are old and outmoded. They are of frame or decaying brick construction. Many were not designed for the purpose for which they are being used, and those that were designed for food handling are a type that was common a century ago. A few have been remodeled. Most are more than one-story high. The buildings have little aisle space. The fire hazard is great and insurance rates are high. Upstairs floors are seldom used, except by tomato ripeners or by the firms' offices. Frequently all that occupies upper floor space are dusty crates, boxes, records, and junk. Many of the stores are only 18 to 20 feet wide and 60 to 100 feet deep. Very few stores have both front and rear platforms. Proper restroom facilities are lacking in many instances. Some of the inadequate market facilities, loading and unloading operations, and narrow streets can be seen in figure 4.

The streets are less than 50 feet wide and the sidewalks are about 10 feet wide. A 15-foot alley, which is too narrow for unloading large trucks, separates some blocks of produce buildings. Dealers that have dock space have great difficulty in maneuvering large trucks to the unloading platforms. Nearly all vehicles are unloaded or loaded through the front door, causing delay and traffic congestion.

There is insufficient public parking space and none that is convenient for sellers or buyers, with

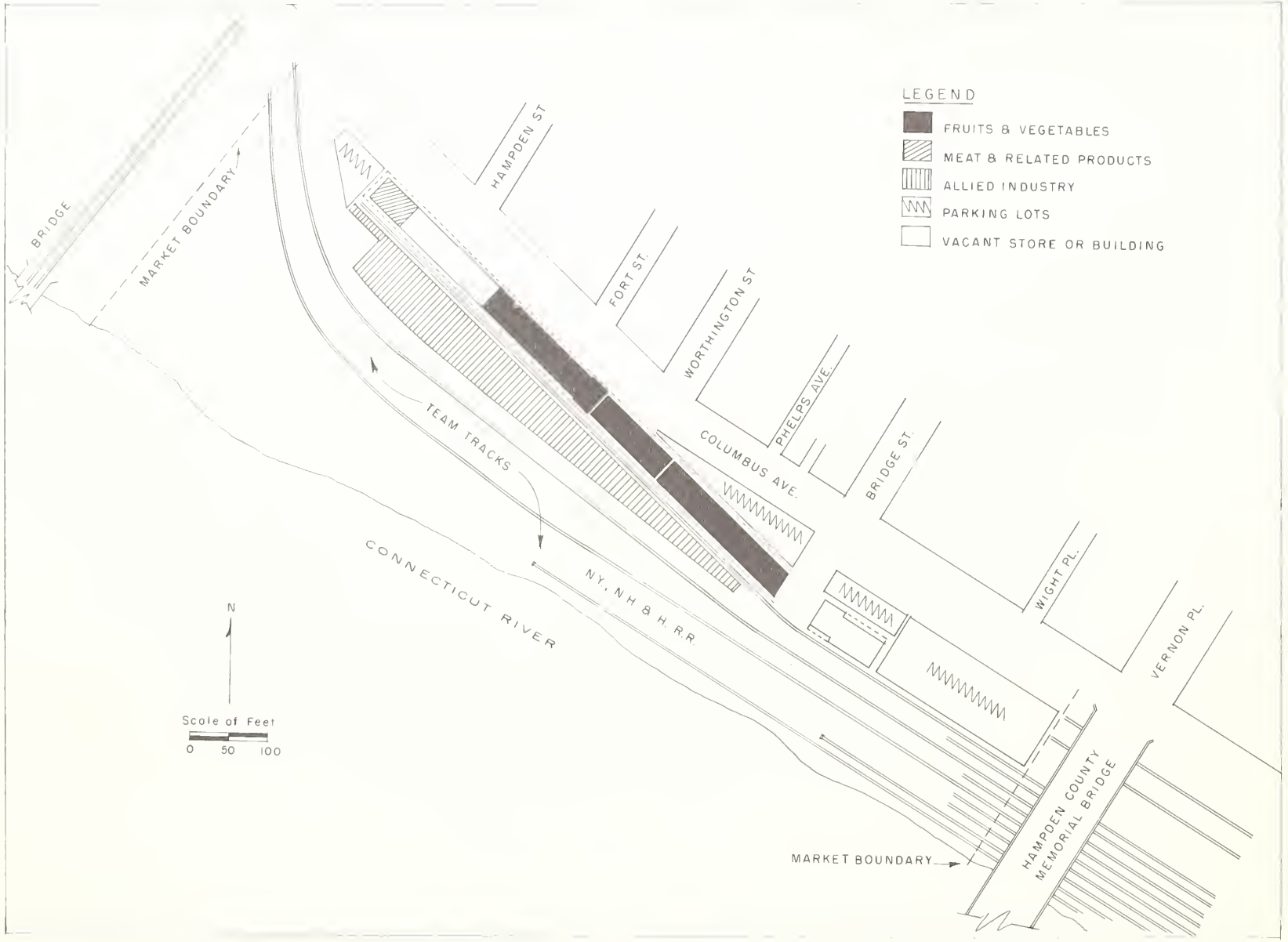

FIGURE 2.—Occupancy of facilities in the Columbus Avenue market area.

FIGURE 3.—Occupancy of facilities in the Lyman Street market area.

the result that buyers receive police notices for traffic violations. They are, therefore, inclined to avoid the market unless it is strictly necessary for them to go there.

The market is served by the Boston and Albany Railroad; spur tracks connect to a few of the facilities; and team tracks are available in the area. The New York, New Haven and Hartford Railroad and the Boston and Maine Railroad are about a mile away.

The farmer-owned cooperative farmers' market consists of less than 2 acres of land with a small shack. The farmers sell products wholesale from their trucks in open, unpaved space.

Other Springfield Wholesale Facilities

Independent wholesale food facilities in the "other Springfield" areas are about evenly dispersed over the city. Most of these facilities are

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FIGURE 4.—The Lyman Street market with narrow, crowded streets and outmoded facilities.

producer, processor, or local service types. Some have been located in outlying districts for reasons of low cost land, convenience to transportation routes, freedom from traffic congestion, and availability of parking space. Many of these facilities are more modern than those in the Columbus-Lyman market.

Public Refrigerated Warehouses

There are four public refrigerated warehouses in the city, two of which are near the Columbus-Lyman market. All are multistory brick and concrete structures. The elevators in the buildings are slow, and excessive handling of the products is necessary on each floor. The buildings have insufficient platform space; they are crowded between other buildings; and they are beset by busy city traffic. Altogether, the space of these warehouses amounts to about 3,863,000 cubic feet.

Facility Ownership and Space Used

More than two-thirds, 75, of the 105 independent wholesale food dealers and handlers reported that they rented the facilities they occupied (table 4). Those renting handled over 76 percent of the receipts. The proportion of receipts by those renting ranged from 34 percent of unloads of dairy products and eggs to 83 percent for fruits and vegetables.

Independent wholesale dealers handling the four food groups occupied 1,099,000 square feet, or 25 acres, of floor space (table 5). The average space ranged from 4,031 square feet per fruit and vegetable dealer to 20,393 square feet per grocery dealer. These dealers used an average of 7,081 square feet of first-floor space and 3,389 square feet of other floor space. About 68 percent of the space used was first-floor space.

Movement of the Commodities Through the Wholesale Food Facilities

Movement of food commodities through the wholesale marketing channels in the city involves the handling of commodities from many scattered unloading or receiving points through the market areas to processors' plants, public warehouses, restaurants, retail stores, and food-chain organizations within the city. This movement, or flow pattern, is further complicated by the sales and transfers of commodities by some wholesale dealers, such as carlot receivers, to other wholesalers in Springfield.

TABLE 4.—*Number of independent wholesalers who own or rent their facilities, by commodity group and volume and percent of volume received, Springfield, 1962*

Commodity group	Wholesalers owning their facilities			Wholesalers renting their facilities			Total		
	Wholesalers	Volume		Wholesalers	Volume		Wholesalers	Volume	
		Actual	Percentage of total receipts		Actual	Percentage of total receipts		Actual	Percentage of total receipts
	Number	*1,000 tons*	*Percent*	*Number*	*1,000 tons*	*Percent*	*Number*	*1,000 tons*	*Percent*
Fresh fruits and vegetables	6	13.8	17.1	28	66.7	82.9	34	80.5	100.0
Meat and related products	9	15.2	23.0	17	51.0	77.0	26	66.2	100.0
Dairy products and eggs	10	16.8	66.1	7	8.6	33.9	17	25.4	100.0
Groceries	5	36.7	20.6	23	141.1	79.4	28	177.8	100.0
Total	30	82.5	23.6	75	267.4	76.4	105	349.9	100.0

TABLE 5.—*Floor space used by independent wholesalers, by commodity group, Springfield, 1962*

Commodity group	Wholesalers	First floor		Other		Total	
		Total	Average	Total	Average	Total	Average
	Number	*Sq. ft.*	*Sq. ft.*	*Sq. ft.*	*Sq. ft.*	*Sq. ft.*	*Sq. ft.*
Fresh fruits and vegetables	34	109, 838	3, 230	27, 232	801	137, 070	4, 031
Meat and related products	26	141, 605	5, 446	124, 112	4, 774	265, 717	10, 220
Dairy products and eggs	17	88, 500	5, 206	37, 125	2, 184	125, 625	7, 390
Groceries	28	403, 575	14, 413	167, 425	5, 979	571, 000	20, 393
Total	105	743, 518	7, 081	355, 894	3, 389	1, 099, 412	10, 470

In the course of moving the 624,000 tons of food from the first point of arrival through the many facilities to their final destination, 85,847 tons moved through or were handled by more than one wholesale facility (table 6). This amounts to 14 percent of the direct receipts. It is estimated that 73,430 tons of these products were transferred from one market area to another within the city, and 12,417 tons were moved between wholesale facilities within the same market area.

The food chains, including their warehousing operations adjoining several retail stores, received 233,457 tons, or about 37 percent, of the total unloads. The food chains also received the greatest amount of intermarket transfers, 33,517 tons from the Columbus-Lyman market and 15,747 tons from independent dealers in "other Springfield" markets.

The following tabulation shows the breakdown of the intermarket transfers (73,430 tons) by market area or type of handler:

	Transfers from—	
	Columbus-Lyman markets	*Other Springfield markets*
Transfers to—	*Tons*	*Tons*
Columbus-Lyman markets	0	6, 498
Other Springfield markets	12, 095	0
Public warehouses	4, 002	1, 571
Food chains	33, 517	15, 747
Total	49, 614	23, 816

Of the 624,000 tons of foods received in Springfield, 53 percent was distributed to retail outlets within the city. The remainder was loaded onto trucks that moved the products out of the city.

Fruits and Vegetables

Of the 122,917 tons of fruits and vegetables that moved through the marketing facilities, about 21 percent, or 25,374 tons, were rehandled (table 6). About 24,755 tons were intermarket transfers and 619 tons were intramarket transfers. The food chains received the greatest amount of the intermarket transfers, 12,634 tons, all of which came from the Columbus-Lyman wholesalers.

A tabulation of intermarket transfers (24,755 tons) by market area or type of handlers shows the following:

	Transfers from—	
	Columbus-Lyman markets	*Other Springfield markets*
Transfers to—	*Tons*	*Tons*
Columbus-Lyman markets	0	1, 394
Other Springfield markets	10, 314	0
Public warehouses	413	0
Food chains	12, 634	0
Total	23, 361	1, 394

There were 67,359 tons distributed to retail facilities within the city, and the balance, 55,558 tons, moved to areas outside the city.

Meat and Related Products

There were 101,945 tons of meat and related products distributed through the wholesale market facilities, of which 26,469 tons, or 26 percent, were moved through more than one facility (table 6). The food chains received the largest amount of these transfers, 20,883 tons, all of which came from the Columbus-Lyman wholesalers.

A tabulation of intermarket transfers (25,980 tons) by market or type of handler shows the following:

	Transfers from—	
	Columbus-Lyman markets	*Other Springfield markets*
Transfers to—	*Tons*	*Tons*
Columbus-Lyman markets	0	1, 456
Other Springfield markets	1, 297	0
Public warehouses	2, 344	0
Food chains	20, 883	0
Total	24, 524	1, 456

There were 49,555 tons distributed to retail facilities within the city, and 52,390 tons to areas outside the city.

Dairy Products and Eggs

During the process of moving the 48,420 tons of dairy products and eggs that were received in Springfield, 5,303 tons, or 11 percent, were transferred from one wholesale facility to another (table 6). Only 98 tons were intramarket trans-

TABLE 6.—*Receipts and interdealer transfers of foods, by type of handler or market area, Springfield, 1962*

Receipts and transfers	Columbus-Lyman markets	Other Springfield markets	Public warehouses	Food-chain organizations	Total
ALL FOODS	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
Direct receipts	175, 682	174, 186	40, 669	233, 457	623, 994
Intermarket receipts	6, 498	12, 095	5, 573	49, 264	73, 430
Total receipts	182, 180	186, 281	46, 242	282, 721	697, 424
Intramarket transfers	6, 296	6, 121	0	0	12, 417
Total handled	188, 476	192, 402	46, 242	282, 721	709, 841
FRUITS AND VEGETABLES					
Direct receipts	68, 340	12, 130	10, 874	31, 573	122, 917
Intermarket receipts	1, 394	10, 314	413	12, 634	24, 755
Total receipts	69, 734	22, 444	11, 287	44, 207	147, 672
Intramarket transfers	619	0	0	0	619
Total handled	70, 353	22, 444	11, 287	44, 207	148, 291
MEAT AND RELATED PRODUCTS					
Direct receipts	52, 929	13, 250	4, 689	31, 077	101, 945
Intermarket receipts	1, 456	1, 297	2, 344	20, 883	25, 980
Total receipts	54, 385	14, 547	7, 033	51, 960	127, 925
Intramarket transfers	489	0	0	0	489
Total handled	54, 874	14, 547	7, 033	51, 960	128, 414
DAIRY PRODUCTS AND EGGS					
Direct receipts	11, 656	13, 711	9, 805	13, 248	48, 420
Intermarket receipts	1, 459	484	1, 813	1, 449	5, 205
Total receipts	13, 115	14, 195	11, 618	14, 697	53, 625
Intramarket transfers	98	0	0	0	98
Total handled	13, 213	14, 195	11, 618	14, 697	53, 723
GROCERIES					
Direct receipts	42, 757	135, 095	15, 301	157, 559	350, 712
Intermarket receipts	2, 189	0	1, 003	14, 298	17, 490
Total receipts	44, 946	135, 095	16, 304	171, 857	368, 202
Intramarket transfers	5, 090	6, 121	0	0	11, 211
Total handled	50, 036	141, 216	16, 304	171, 857	379, 413

fers, but 5,205 tons were intermarket transfers. The food chains handled 13,248 tons of direct receipts, and 1,449 tons of intermarket receipts from the "other Springfield" independent dealers.

A tabulation of intermarket transfers (5,205 tons) by market area or type of handler shows the following:

	Transfers from—	
	Columbus-Lyman markets	*Other Springfield markets*
Transfers to—	*Tons*	*Tons*
Columbus-Lyman markets	0	1, 459
Other Springfield markets	484	0
Public warehouses	242	1, 571
Food chains	0	1, 449
Total	726	4, 479

Of the total food distributed, 42 percent, 20,291 tons, was moved to retail outlets within the city and 58 percent, 28,129 tons, was trucked to points outside the city.

Groceries

The direct receipts of groceries amounted to 350,712 tons. Only 8 percent, or 28,701 tons (intramarket and intermarket transfers) moved through more than one facility (table 6). The food chains received the greatest amount of the intermarket transfers, 14,298 tons, all of which came from the "other Springfield" wholesalers. The chains handled and distributed receipts of 171,857 tons.

A tabulation of intermarket transfers (17,490 tons) by market area or type of handler shows the following:

Transfers to—	Tranfer from— Columbus-Lyman markets	Other Springfield markets
	Tons	Tons
Columbus-Lyman market	0	2,189
Other Springfield markets	0	0
Public warehouses	1,003	0
Food chains	0	14,298
Total	1,003	16,487

Of the total direct receipts, 193,710 tons, or 55 percent, were distributed to retail outlets within the city, the other 45 percent, 157,002 tons was moved to areas outside the city.

Some Marketing Costs Incurred by Independent Wholesalers

An important part of the cost of marketing is the cost of moving merchandise. This cost depends on the kind of operation and the type of facilities used. Unnecessary handling of a commodity increases handling and associated costs, such as spoilage. Some of the costs associated with handling food products are intangible and cannot be measured readily. Measurable annual costs that would be affected by facility improvement include (1) cartage from railroad track or point of initial receipt to wholesaler's store, (2) handling of the commodities from point of unloading until they are loaded onto a truck for delivery, (3) handling of products moved through more than one wholesale facility, (4) spoilage, deterioration, breakage, and shrinkage, and (5) rental costs.

These cost data for the independent dealers were obtained by examining wholesalers' records and analyzing time-study information. These estimates were then checked with similar cost studies made for other cities. In computing costs, not all wholesalers' data were analyzed, but dealers were sampled in such a way that all volumes and types of operations would be represented.

The marketing costs for public warehouses and food chains were not computed.

Cartage

Cartage costs are those incurred in loading commodities into trucks and moving them from team tracks or other points of initial receipt (such as local processors) to the dealer's store. These costs did not include unloading at stores; unloading costs were included in handling costs. Those firms not served by rail spurs incurred the greatest cartage costs. Only 5,766 tons, about 2 percent of the total tonnage handled or about 6 percent of the rail tonnage received by independent wholesalers, was subject to cartage charges. Of the amount subject to cartage, about 70 percent was meat and related products, as may be seen in table 7. Cartage cost the independent wholesale dealers $22,500 during the year studied.

Handling

Handling included unloading commodities from a truck or rail car at the store, moving them into the store, and sorting, reassembling, preparing for loading, and loading them onto a truck for delivery. When highway truck drivers assisted in unloading at the store, the value of their services was included in the handling cost, although the dealer may not have paid the cost directly.

A comparison of the handling costs of the various commodity-group wholesalers indicates substantial differences. In general, commodities that were stored for a short time had lower handling costs than those stored longer. Also, commodities handled in units, such as pallet loads or large boxes, and in such ways that bulk lots were kept intact had lower handling costs. The meat handling cost, $22.45 per ton, was highest because of the great amount of meat cutting.

The total cost of handling foods by independent wholesalers was estimated at $3,670,500, or about $9.64 per ton. These costs are summarized in table 7.

Transfers Between Dealers' Facilities

A total of 85,847 tons of food was handled by two or more dealers (table 7). Some of this type of movement is normal and often in the best interest of economy, because an individual dealer may specialize in specific items, whereas others may prefer to stock several items and buy needed supplies from the specialists. However, when commodities are handled by more than one dealer because of physical defects in a dealer's store, or lack of rail spurs to the store, interdealer handling costs become excessive and can be reduced. Several dealers of meat and related products purchased products from other dealers simply because they lacked rail facilities or adequate cooler space. Wholesale fruit and vegetable dealers in the areas away from the Columbus-Lyman market had similar difficulties. As shown in table 7, these transfer costs amounted to $253,800.

Transfer cost was the cost of moving the commodities from one dealer's facility to another's; it did not include the cost of handling within either the originating or the receiving store, since this cost was included in the handling cost of the dealers. Variations in the costs of different commodities and in other cost breakdowns can be partially explained by the different methods used to transport commodities between dealers. Transportation equipment observed varied from a two-wheel handtruck to a refrigerated truck. The commodities were moved varying distances, from a few feet to completely across the city.

TABLE 7.—*Cartage, handling, interdealer transfer, and spoilage, deterioration, breakage, and shrinkage costs incurred by independent wholesalers, by commodity group, Springfield, 1962*

Cost item and commodity group	Volume	Cost	
		Per ton	Total
CARTAGE			
Fresh fruits and vegetables	*Tons* 940	*Dollars* 4. 15	*Dollars* 3, 900
Meat and related products	4, 010	3. 90	15, 600
Dairy products and eggs	32	3. 10	100
Groceries	784	3. 70	2, 900
Total or average	5, 766	3. 90	22, 500
HANDLING			
Fresh fruits and vegetables	[1] 92, 797	5. 50	510, 400
Meat and related products	[1] 69, 421	22. 45	1, 558, 500
Dairy products and eggs	[1] 27, 408	6. 10	167, 200
Groceries	[1] 191, 252	7. 50	1, 434, 400
Total or average	380, 878	9. 64	3,.670, 500
INTERDEALER TRANSFER			
Fresh fruits and vegetables	25, 374	3. 25	82, 500
Meat and related products	26, 469	2. 85	75, 400
Dairy products and eggs	5, 303	2. 40	12, 700
Groceries	28, 701	2. 90	83, 200
Total or average	85, 847	2. 96	253, 800
SPOILAGE, DETERIORATION, BREAKAGE, AND SHRINKAGE			
Fresh fruits and vegetables	[1] 92, 797	2. 55	236, 600
Meat and related products	[1] 69, 421	5. 00	347, 100
Dairy products and eggs	[1] 27, 408	2. 00	54, 800
Groceries	[1] 191, 252	1. 50	286, 900
Total or average	380, 878	2. 43	925, 400

[1] Includes direct receipts by independent wholesalers plus intermarket and intramarket transfers.

Spoilage, Deterioration, Breakage, and Shrinkage

Costs of spoilage, deterioration, breakage, and shrinkage were estimated for the various commodities. In many cases, these costs would have been materially reduced if there had been less handling or if handling methods had been improved. In other cases, little could be done to reduce the costs among facilities that did not lend themselves either to protection or refrigeration of products.

Costs were computed from estimates given by local wholesalers and confirmed by records of a sample of dealers. The average cost amounted to $2.43 per ton.

The total cost of spoilage, deterioration, breakage, and shrinkage for all independent wholesale food dealers was $925,400. These costs, by commodity group, are shown in table 7.

Rentals

When wholesale dealers were interviewed, rent data were collected. Problems were encountered in estimating rental figures for dealers owning their own facilities because most had no accurate means of estimating a reasonable rental value of their property. In such instances, the average rental for similar property was assumed to apply. The actual rent paid by individual wholesalers varied substantially.

The highest cost per square foot was paid by dairy products and egg wholesalers. Apparent divergencies probably are attributable to (1) the location and types of facilities, (2) the degree of suitability of the facilities, and (3) the type of operation.

The total annual rent or rental value for all wholesale food handlers was estimated at $732,400, or an average of $0.67 per square foot. This estimate does not include rents paid for farmers' stalls, brokers' offices, or similar facilities. A detailed description of rental costs, by commodity group, is shown in table 8.

Summary of Selected Costs

The estimated costs for cartage, handling, interdealer transfers, spoilage, deterioration, breakage, and shrinkage, and rentals amounted to about $5.6 million, $16.02 per ton, for the 349,868 tons of direct

TABLE 8.—*Rental for facilities of independent food wholesalers, by commodity group, Springfield, 1962*

Commodity group	Space used	Cost per square foot	Annual rental value
Fresh fruits and vegetables	*Sq. ft.* 137, 070	*Dollars* 0. 74	*Dollars* 101, 400
Meat and related products	265, 717	. 75	198, 900
Dairy products and eggs	125, 625	. 80	100, 200
Groceries	571, 000	. 58	331, 900
Total or average	1, 099, 412	0. 67	732, 400

receipts that were handled by independent dealers. The following tabulation shows the total costs by commodity group:

Fresh fruits and vegetables	$934,800
Meat and related products	2,195,500
Dairy products and eggs	335,000
Groceries	2,139,300
Total	5,604,600

Other Marketing Costs

Traffic congestion, often a major cost factor in other cities, did not increase costs materially in the market areas in Springfield. Some delay was observed in the Columbus-Lyman market. Employee parking for the firms also presented some problem. However, delay did not seem to be as much of an economic factor as it was a nuisance and inconvenience. Consequently, the monetary cost of traffic delay has not been included in this study.

In addition to the inconvenience of traffic congestion, there was inconvenience because of the present split market situation. The split market was especially inconvenient because neither the buyer nor the seller could keep well informed regarding prices and supplies in a fast-moving market.

NEED FOR NEW FACILITIES

The preceding chapters describe the wholesale facilities, market areas, and the flow and major costs of moving foods through the wholesale marketing system in Springfield. Many inadequacies exist that make marketing costs excessive and prevent the expeditious and efficient handling of the food items. The inadequacies did not apply to every dealer, but they were prevalent among many, and were common to all the types of food covered in the study.

Before any decisions are made on whether new facilities are needed and the kinds and amounts of facilities required, the main conditions that need correction should be set forth.

Inadequate Structures

Each wholesale merchant was asked whether he considered his facility to be adequate or inadequate, and almost everyone expressed the opinion that the facility was very inadequate. A cursory examination revealed that the facilities were even more inadequate than the proprietors realized. A few wholesalers had previously attempted to improve their facilities, but the extent of improvement was limited.

Buildings are inefficient because they were not designed for rapid handling of heavy, bulky, and perishable foods. Most of the buildings have no platforms on which to unload incoming supplies, or to assemble and load outgoing products. Most of the stores have only front entrances through which all products must be moved in and out. As a result, much of the space in the rear of the stores is inefficiently used.

Many buildings lack satisfactory toilet and sanitation facilities. The farmers' market must utilize neighbors' sanitary facilities, which are often inconvenient. Streets and sidewalks are often littered with decaying vegetation, refuse, crates, and broken boxes.

Inadequate cooler space causes financial losses to dealers. There is little demand for wilted or stale products, and the prices they bring are low.

Marketing Costs Are Excessive

Much of the high cost of handling food can be attributed to the lack of rail connections, the narrow market streets, and the lack of loading and unloading platforms of proper height. Excessive costs for porters and other exorbitant handling costs are due to the outmoded method of unloading and loading packages one by one. This method is used because of the impossibility in most instances of backing a trailer or truck up to a store platform to receive or ship the merchandise. The same packages are moved several times inside stores that lack wide platforms, because of the confusion caused by bringing the products into the stores, assembling orders, and moving them out at the same time through the same door. In most facilities material handling equipment, such as modern wholesale warehouses use, is virtually nonexistent. When trucks cannot move into the market area because of the traffic congestion that sometimes develops, wholesalers must dispatch two-wheel handtrucks loaded with a few packages to the buyer's vehicle. These conditions lead to increased costs for moving products into, within, and out of the stores and the market areas.

Products Move Through Too Many Facilities

About one-seventh, or 85,847 tons, of the total receipts was handled by two or more wholesale dealers at a cost of $253,800. The dealers are scattered and in many instances are far distances apart. Most wholesalers try to maintain a list of steady customers and to keep supplies on hand to meet their demands. Often, jobbers, purveyors, and other specialists must purchase supplies from other wholesalers within the market area or from other areas within the city to supply their customers. Sometimes rail shipments are received at public warehouses and carted to the customers as they are needed. Dealers who handle the com-

modities through more than one facility are at a competitive disadvantage. Such extra handling requires rental of more space, in addition to the cost of loading, carting, and unloading from facility to facility, plus the breakage, spoilage, and deterioration caused by excessive handling.

Lack of a Unified Market

Food marketing in Springfield is disjointed. Jobbers, specialists, and other buyers must shop in the Lyman Street market, a carlot receiving market on Columbus Avenue, and in widespread facilities in other parts of Springfield. The trade claims that the number of buyers that visit the various wholesale facilities has declined in recent years, while increasing numbers of them have been observed in modern markets outside the State. It is reported that some wholesalers from Hartford come to Springfield team tracks for produce from California, Arizona, and Texas, and haul it to their locations. Because of their centrally located modern facilities, they can deliver it to retail outlets in Springfield and its environs in better quality and at a lower price than the Springfield markets.

Independent wholesalers delivered to customers 58 percent of the receipts of fruits and vegetables, 95 percent of the meat and related products, 89 percent of the dairy products and eggs, and 96 percent of the groceries. The percentage of fruits and vegetables delivered from the Columbus-Lyman market was substantially less than that delivered from the "other Springfield" area, but a higher percentage of dairy products and eggs was delivered from the Columbus-Lyman market area than from "other Springfield" (table 9).

Altogether, 79 percent of the supplies of the Columbus-Lyman market area and 96 percent of those of "other Springfield" were delivered by independent wholesalers and the remainder was picked up by customers. The food chains delivered all the products they handled to their retail stores.

TABLE 9.—*Percentage of receipts delivered by independent wholesalers, by food group and market area, Springfield, 1962*

Market area	Fruits and vegetables	Meat and related products	Dairy products and eggs	Groceries	Average by volume
	Percent	*Percent*	*Percent*	*Percent*	*Percent*
Columbus-Lyman	51	96	98	90	79
Other Springfield	91	94	84	98	96
Average	58	95	89	96	89

Poor Working Conditions

Some proprietors are disappointed that their sons have no interest in continuing the business. The sons want dignified work where innovation is rewarding, the environment is pleasant, the furnishings are modern, the atmosphere is healthy, the hours are regular, and their occupation is profitable. There is no reason why food marketing should be more backward than any other type of business. However, many of the facilities in Springfield lack the most modest comforts and conveniences.

Traffic Congestion and Other Problems

Occasionally a few tractor-trailers, attempting to maneuver in the narrow streets and alleys, interfere with other marketing vehicles and restrict the free flow of traffic.

Two market areas and separate facilities in the downtown district might be well for retailing, but not for wholesaling. The traffic problem in the Springfield market areas is not as serious as in some of the wholesale markets of other cities.

FACTORS TO CONSIDER IN PLANNING MARKETS

In planning new facilities for the wholesale food industry in Springfield, several factors must be evaluated. What kind of wholesale market is needed? And how should it be designed, constructed, equipped, and operated to correct the inadequacies of the existing markets and enable the distribution of supplies in the most efficient manner? To reach these decisions, the planners should consider the following essentials of a wholesale food distribution center: completeness, adequate facilities, suitable arrangement of facilities, proper location of the market, sufficient land at reasonable cost, and sound management.

Completeness

A food distribution center should accommodate all types of food wholesalers and processors who may need new facilities. It should contain space for independent food wholesalers, food processors, manufacturers' branch houses, food-chain organizations, meatpacker branch houses, and all other segments of the wholesale food industry that may desire to locate in it now or later.

There should be no discrimination of competing groups of the food industry.

In addition to suitable buildings, auxiliary facilities should be available, such as ample parking

areas, wide streets, and rail spurs to wholesale stores and warehouses. There should be refrigerated warehousing, restaurants, public restrooms, a gasoline station, and a garage. Office or other space is needed for banks, credit firms, management, inspection service, telegraph and leased wire service, brokers, barber shops, and other individuals and organizations interested in servicing the wholesale market.

When dealers in all kinds of food are located in one market, a complete line of products can be delivered to retail outlets or picked up speedily by buyers shopping in the market. Good access roads will eliminate traffic delay, and the necessity of driving to many parts of the city will be removed. When the direct interstate routes pass near market entrances and exits, buyers and distributors will measure their travel in minutes rather than miles.

Individual food wholesalers are tending to handle a greater number of products. Some of these wholesalers handle almost a complete line of commodities. At times, it is difficult for this type of wholesaler to receive the desired quantity of every item when needed, and he must buy it from another receiver. Also, certain carlot receivers specialize in one or two products and serve as suppliers for jobbers and other wholesalers. In a complete market center, operations can be carried out with a minimum of unloading cost by sharing full railroad cars on a common platform, and intramarket transfers can be made with much less cartage cost on the jointly used platforms.

A center with sufficient acreage and with facilities to accommodate all food wholesalers and processors would cause most wholesale dealers to want to locate there. The same factors that determine the choice of a center by a committee of the trade and city officials, or any other group authorized to do so, would likely be the same factors that would influence the wholesale handler in his choice of a location.

Adequate Facilities

The facilities for a distribution center should be free of the defects that have been pointed out. The buildings must be carefully designed to satisfy the needs of each different kind of food handler. Different types of buildings will be required for large-volume and for small-volume handlers of the same food products. The wholesale buildings should provide ample space for unloading, display, storage, and sale of supplies, and they should have both front and rear entrances.

One-story buildings with covered platforms and rear platforms, except grocery buildings, are essential in the efficient wholesale handling of some foods. The covered platforms should be at the height of rail car floors at the rear of buildings where tracks are provided, and at truckbed height at the front and at the same level as the store floor. This permits low-cost unloading, interior handling, and loading out by forklift trucks, pallet transporters, or clamp trucks. Certain buildings should have mezzanine offices overlooking the sales floor to allow full use of the floor area for high-stacking handling operations.

The food processing and wholesaling industry is undergoing varied and rapid changes. Each type of wholesale store should be designed so that it can be modified or expanded to meet the demands of the future, either for its initial use, or for other uses. The buildings should be plain and relatively inexpensive. Nothing is gained if the savings achieved through efficient facilities are offset by such expensive buildings that the carrying charges amount to as much as the savings effected.

Suitable Arrangement of Facilities

When designing a wholesale market, the designer should give special consideration to the arranging of facilities on a given site. Each group of similar products should be located in a separate section of the site, and wholesale facilities should be planned for those dealers who would agree to move into the market if it were built. Sufficient land must be set aside for these dealers plus any prospective dealers who may wish to build eventually on the market site. A market design should provide an expansion area for each building and for each segment of the food industry. An expansion area should be set aside for service buildings and other allied industries that may desire to locate in the distribution center, such as bakers, ice cream and other food processors, fluid milk distributors, truckers, general warehousers, and equipment wholesalers.

Proper Location

Several factors must be taken into consideration in selecting a location for a wholesale food distribution center. First, the site should be accessible to all railroads that bring food products to the city. Second, it should be easy to reach from all highways that are important in bringing in supplies. Arterial highways should provide access to buyers from all directions.

In addition to being convenient to all means of transportation, the food distribution center should be near the center of distribution to retail outlets. This permits moving supplies as short a distance as possible after they reach the market. It would also eliminate the establishment of intermediary markets, which tend to increase marketing costs.

Reasonable Land Cost

Because a large amount of land is needed for wide streets, ample parking areas, expansion areas, and one-story buildings, it is advisable to acquire

enough land and at a reasonable price. Otherwise, the high rentals required to amortize the complete investment would tend to offset any savings that might be made. Hence, if new facilities are to be built, they should be located outside the high-priced downtown area or other places where land is costly.

Special consideration should be given, when appraising the cost of land for a market site, to items such as acquisition, removal of buildings on the site, and preparation of the land for construction.

Sound Management

No matter how well a food distribution center has been designed, how complete it is, or how perfect the location, it cannot function efficiently unless it is well managed. It should be managed so that it will operate at low cost and without discrimination against any type of dealer or buyer, any form of transportation, or delivery of products from any location. Charges for the use of facilities should provide only for the cost of operating and maintaining the center. Dealers who operate within the market should be allowed as much individual initiative in conducting their businesses as possible. However, the market management should be strong enough to assist the industry in enforcing desirable regulations.

In order that the proposed wholesale market may operate properly, its board of directors, or other management agency, should be interested in the financial success of the center as a whole and in the welfare of shippers, dealers, buyers, consumers, transportation agencies, and the appropriate agencies of government.

FACILITIES NEEDED FOR A WHOLESALE FOOD DISTRIBUTION CENTER

The facilities recommended in this report are based on the volume of foods handled by the wholesale dealers who would benefit by moving to new facilities or who, because of city redevelopment plans and for other reasons, may have to relocate.

The number of wholesalers and the volume of business that would actually go into the food distribution center should be determined by the number of responsible wholesalers who would sign firm leases or construct buildings in it. This precaution is necessary to prevent overbuilding and insure occupancy of all facilities.

Several wholesalers would not be expected to relocate at the present time. Some grocery service wholesalers have modern structures and are conveniently located. A few meat wholesalers have leases that must expire before they can contemplate a change of location. A few poultry, egg, and dairy products wholesalers and some fresh fruit and vegetable dealers believe that they need to be located in the production areas, but they are contemplating use of some facilities in the food distribution center for processing and marketing.

Sixty-seven independent wholesale food handlers who received 211,142 tons of the commodity groups in 1962 (including farmers' market receipts) are included in the plans for the center (table 10). In addition, one food-chain organization and an operator of a refrigerated warehouse expressed an interest in constructing facilities on the market site.

The facility needs of each dealer were determined from interviews and from studying his operations. From these interviews and studies it was concluded that most of the independent wholesalers could be placed in four multiple-occupancy buildings and in a new refrigerated warehouse. Two large-volume independent grocery wholesalers and a food-chain organization could occupy three separate single-occupancy buildings.

In addition, such a market should include, in its initial construction, the following facilities:

1. House tracks for 81 rail cars.
2. One restaurant occupying an additional unit in the fruit and vegetable multiple-occupancy building.
3. Restrooms in the basement of the restaurant.
4. Twenty-four offices and supplementary facilities for market management, brokers, and allied organizations.
5. Paved streets, 200 feet wide where multiple-occupancy buildings face each other.
6. Parking spaces for about 1,000 cars and trucks.
7. A service area with a gas station, garage, and perhaps a second restaurant (roadside steakhouse).
8. An expansion area to allow for construction of additional buildings and expansion space for enlargement of buildings.

The kind and amount of facilities needed for each food group are discussed in the following sections.

Fruits and Vegetables

It was determined that all fruit and vegetable dealers in the Columbus-Lyman market area and a few outside the market area would benefit by moving to a new wholesale food center, even though a few dealers had relatively efficient facilities. The suggested facilities include a multiple-occupancy building with 21 store units for 26 dealers and an

TABLE 10.—*Number and type of independent dealers planned for in a new food distribution center in Springfield, buildings they will occupy, and estimated annual tonnage*

Food group and type of facility	Dealers	Buildings	Units	Volume of receipts
FRUITS AND VEGETABLES	*Number*	*Number*	*Number*	*Tons*
Multiple-occupancy	26	1	21	57, 200
Special purpose	2	(1)	2	5, 225
Farmers' market	----------	----------	[2] (50)	7, 450
Total	28	1	23	69, 875
MEAT AND RELATED PRODUCTS				
Multiple-occupancy	14	1	18	47, 747
Special purpose	3	(1)	3	4, 078
Total	17	1	21	51, 825
DAIRY PRODUCTS AND EGGS				
Multiple-occupancy	6	(3)	3	8, 700
Special purpose	1	(1)	1	2, 375
Total	7	(3)	4	11, 075
GROCERIES				
Multiple-occupancy	13	2	55	41, 457
Single-occupancy	2	2	----------	36, 910
Total	15	4	55	78, 367
Food-chain warehouse	----------	1	----------	(4)
Refrigerated warehouse	----------	1	----------	(4)
Grand total	[5] 67	8	103	211, 142

[1] Would desire to be tenants in the refrigerated warehouse.
[2] Covered stalls.
[3] Part of meat and related products building.
[4] Volume of receipts in the refrigerated warehouse and food-chain warehouse not available.
[5] Includes 59 independent wholesalers in multiple-occupancy buildings, 6 in a refrigerated warehouse, and 2 in single-occupancy buildings.

additional unit for a restaurant. A total of 57,200 tons of fruits and vegetables could be handled annually by the dealers, including processors and other specialists, in the multiple-occupancy building. There are two additional dealers, specialists in frozen foods, handling 5,225 tons of fruits and vegetables who could be tenants in a new refrigerated warehouse that is proposed for the food center.

Each fruit and vegetable unit would be 25 feet wide, 70 feet long (interior dimension), and 20 feet high. A 14-foot covered platform, front and rear, and a 2-foot total thickness of front and rear walls make the total depth 100 feet (figs. 5 and 6). The building would be 550 feet long. All units should contain mezzanines, 17 feet deep by 25 feet wide and 11 feet above the floor, at the rear for toilet facilities and for offices or light storage.

Each unit would contain 1,750 square feet of enclosed first floor space, 700 square feet of platform space, 50 square feet of front and rear wall space, and 425 square feet on each mezzanine. Thus, each unit would contain 2,925 square feet, or 61,425 square feet for the 21 store units, exclusive of the restaurant unit. Stairs to the mezzanine should occupy a minimum of floor space.

The 25-foot store units may be subdivided to suit the space requirements of dealers. Since individual wholesalers may wish to lease more than one unit, removable partitions should be used. Such partitions should be waterproofed to prevent seepage between units.

The plan provides continuous platforms and floors on the same level. All floors and platforms on the first floor should have a nonskid concrete surface and should be sloped to the floor drains. Floors in the stores should be designed for a live load of about 400 pounds per square foot to accommodate loads stacked 3-high on pallet racks, and mezzanine floors for a live load of 75 pounds per square foot.

The front platforms should be at truckbed height, about 45 inches, with recessed steps at every fourth unit, and the rear platform at refrigerated

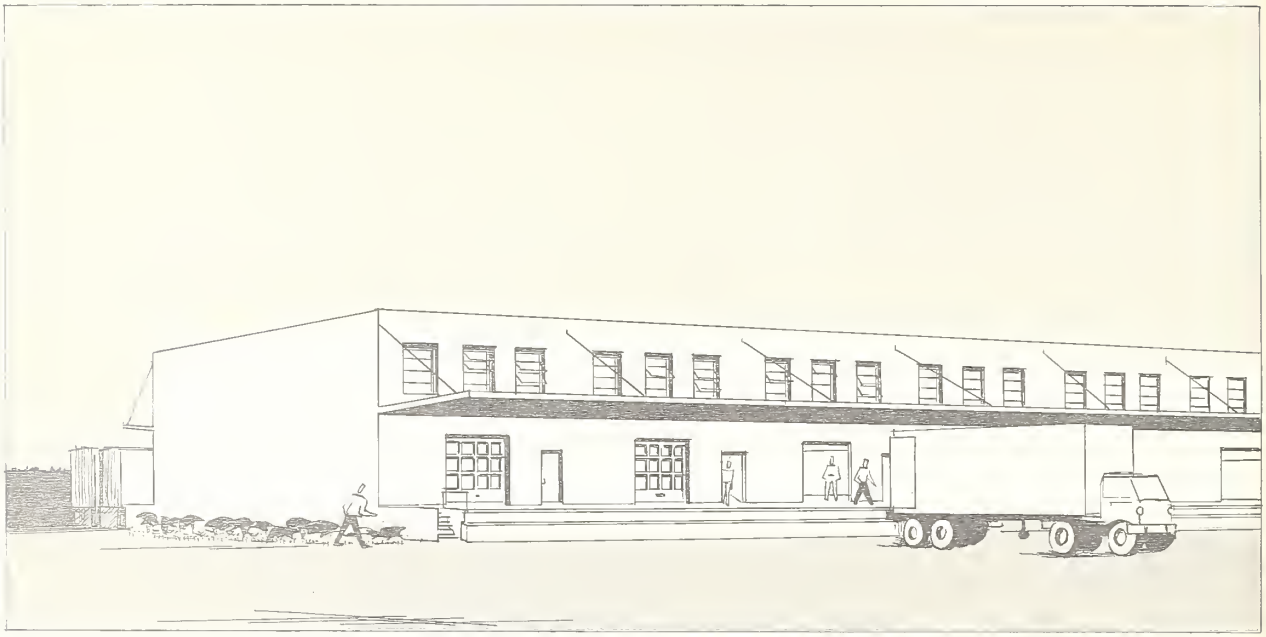

FIGURE 5.—Fruit and vegetable multiple-occupancy building.

car floor level, about 55 inches high. A wooden or standard rubber bumper should be attached to the edge of the platforms to protect them from damage. A continuous step along the front platform, about half the height of the platform and at least 24 inches wide would accommodate the loading of small trucks.

The roof over the front platform should extend 6 feet beyond the edge of the platform to provide protection from the weather during loading and unloading. The roof sheltering both platforms is suspended and held by guy rods.

Front doors are 8 feet wide. A rear door 6 feet wide is double acting and offset to allow for a cooler. A small door should be installed at the front to permit access without opening the main door.

Gas or electric space units would provide heat. Because of variations in requirements of individual wholesalers, each occupant should equip his store with the necessary refrigeration capacity.

Adequate ventilation is necessary to prevent hot or stagnant air from collecting in the ceiling area and to prevent condensation during the cool season.

Interiors of the stores should be well lighted and switches for partial lighting should be provided. There should be sufficient electrical outlets to permit the use of special appliances and equipment.

The double rail tracks at the rear of the building should be set into the pavement to allow trucks to move over them. These tracks could furnish extra capacity for spotting cars during peak seasons and also serve as team tracks for direct delivery from car to buyer's vehicle.

The Farmers' Market

Two multipurpose sales sheds, containing 50 stalls, are recommended to handle the 7,450 tons of commodities received in the farmers' wholesale market on Lyman Street.

These sheds would be 250 feet long with a 13-foot high roof covering a concrete platform, which would be 36 inches above the street level and 10 feet wide. A continuous step, 24 inches wide and 18 inches high, should be constructed along one side of the platform to permit ready access for buyers, increasing the depth to 12 feet. The platforms would contain 6,000 square feet of space, including the continuous step. Spaces 10 feet wide may be marked off on the platforms to provide 50 stalls, and each stall would measure 10 feet by 12 feet.

A roof overhang of 6 feet would provide protection from the weather. The column supports for the roof would be placed at 10-foot intervals in the center of the platform.

A driveway 40 feet wide between the two sheds is recommended for buyers' vehicles. A 50-foot street on the other side of each shed would permit farmers' trucks to back up to their stalls and unload across the platforms to the buyers' vehicles.

To prevent blocking the driveway between the sheds, customers would select and buy the products they wanted, then drive their trucks or cars parallel to the platforms, stopping long enough to pick up their purchases, and drive away. If a farmer sells as much as half a truck load, he would find it less laborious to drive his truck to an open space and transfer the sales over the tailgate to the

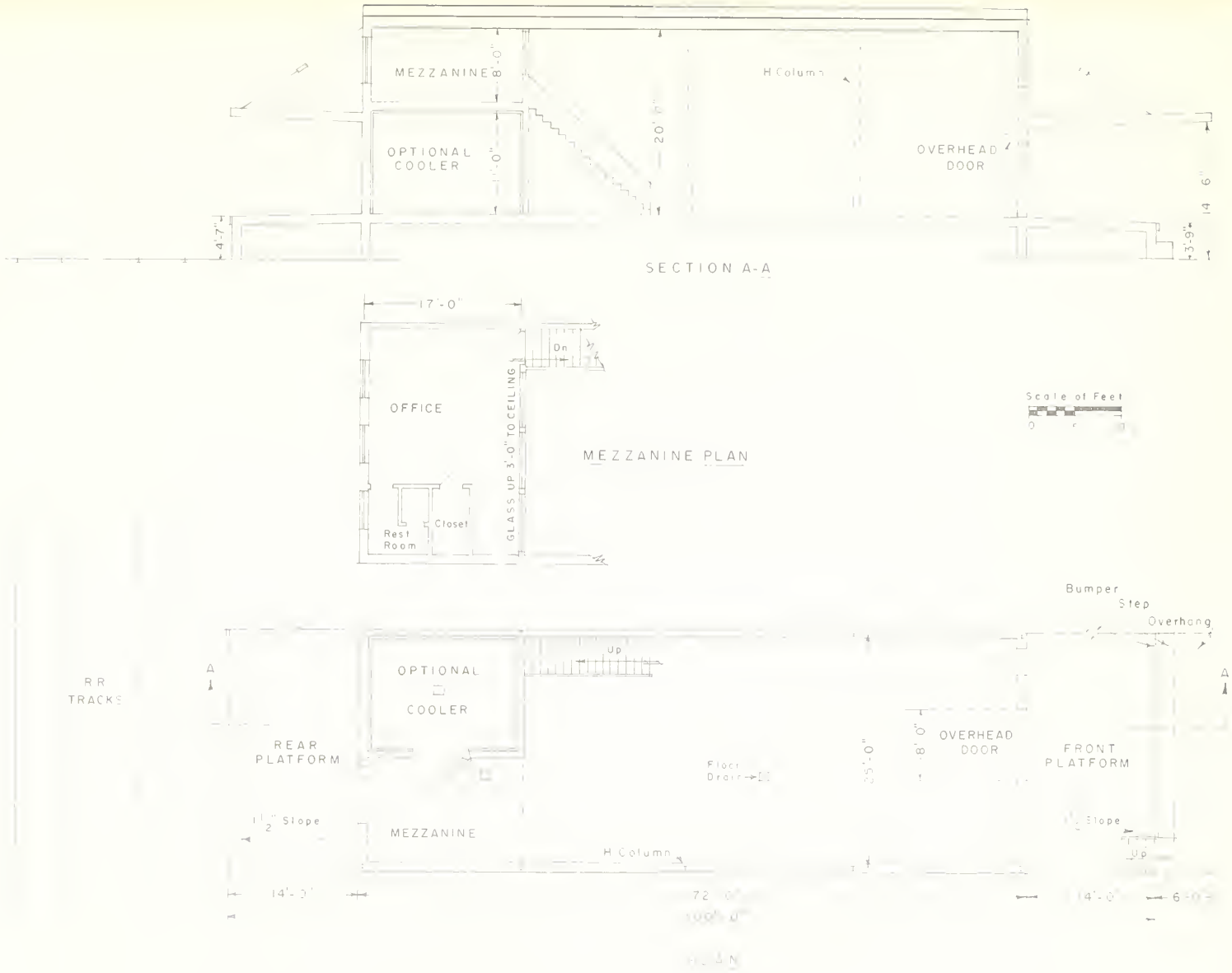

FIGURE 6.—Fruit and vegetable store.

buyer's vehicle. If a large quantity is sold to a wholesaler dealer, the farmer could deliver the produce to the buyer's store.

The total area needed for operations, sales, and parking would be 2.1 acres, more than half an acre larger than the present 1.5 acres owned by the farmers' cooperative.

Meat and Related Products

The facilities in the meat section include 1 multiple-occupancy building containing 18 units for 14 dealers handling 47,747 tons of meat and related products. This building will contain two floors (fig. 7). The first floor of each unit is 25 feet wide and 100 feet deep including a 14-foot covered platform 55 inches above the rail tracks at the rear and a 14-foot covered platform 45 inches above the ground at the front. The dimensions of the second floor are 25 feet by 72 feet overall. The interior height of the stores should be at least 20 feet to allow 12 feet for the first floor and 8 feet, exclusive of floor thickness, for the second floor.

Each unit contains 1,800 square feet, including walls, of enclosed first-floor space, 1,800 square feet on the second floor, and 700 square feet of platform space, which amounts to 4,300 square feet. The 18 units contain 77,400 square feet, of which 32,400 would be enclosed first-floor space. The second floor would also contain 32,400 square feet, including walls. Platform space would total 12,600 square feet.

A 6-foot roof overhang on the front platform is provided to protect the merchandise and workers from inclement weather. These roof structures are supported by columns.

The front platform should have convenient steps to furnish access for pedestrians to the stores. A wooden or standard rubber bumper should be attached to the edge of both platforms to protect them from damage. Both platforms should be sloped slightly toward the streets to give adequate drainage. The platforms should have a nonskid surface.

Two overhead meat rails, a minimum of 7½ feet and a maximum of 9 feet from the floor to the top of the rail, should be suspended from the roof structures on the front and rear platforms. In some modern wholesale meat markets, these rails run the full length of the platforms and have rail switches to the interior of each store. The meat rails can be used for unloading, loading out, and for transporting intramarket sales between wholesalers, but for economy the minimum amount of meat rails for entrance to stores is suggested. The meat rails in coolers or work rooms would be spaced about 2 feet 6 inches apart for beef sides and less for veal, lamb, and pork, varying according to the type of product being handled.

The units are designed so they may be adapted to various types and sizes of operations. The final design of the building should incorporate a removable partition between units so that two or more units could be combined to make a larger area. The partitions should be of waterproof materials.

Offices would be located on the second floor. Part of the space on this floor would be used as a dressing room and wash room. There would also be a refrigeration equipment room and a large room for storing cartons, wrapping paper, and other materials and such products as spices, meat sauces, pickles, and like items.

First floors should be constructed either of vitrified brick of good quality, bonded with acid-resistant waterproofing mortar and laid on a waterproof concrete base, or of dense, acid-resistant waterproof concrete. Floors should be well drained with at least one drainage inlet for each 400 square feet of enclosed space. Floors should slope ⅛ inch per foot in coolers and as much as ¼ inch per foot in areas where large quantities of water may accumulate. When drains are in areas where the water seal in the trap is likely to evaporate, drains with screw-type plugs should be used. The first floor should be designed for a live load of 400 pounds per square foot; the earth under reinforced concrete slabs should be firmly compacted.

Buildings should be constructed of columns and beams of sufficient size and strength to support second-floor loading of 100 pounds per square foot. All foundations should meet the basic needs and anticipated loads and be constructed according to acceptable standards and methods of the building code.

Walls and ceilings should be finished in accordance with inspection and health standards.

Adequate lighting and sufficient electrical outlets for all processing and service equipment should be provided.

It is assumed that each tenant would furnish his own insulated and refrigerated cooler space and interior meat rail systems. Any installation of refrigeration equipment should have the capacity to maintain temperatures from zero to 32 degrees.

Sufficient hot water at about 180° F. should be supplied. Units requiring steam would supply their own needs.

Rail access is provided by a house track at the rear platform.

Dairy Products and Eggs

Three units attached to the meat and meat products multiple-occupancy building are designed to accommodate wholesale dealers who handle 8,700 tons of dairy products and eggs.

Each unit is 30 feet wide by 70 feet deep with 14-foot covered platforms at the front and rear. Allowing 2 feet for the front and rear walls, each unit has overall dimensions of 30 feet by 100 feet. Ceilings are 20 feet high.

Space for offices, dry storage, and toilets is provided on the 17- by 30-foot mezzanine. Each unit

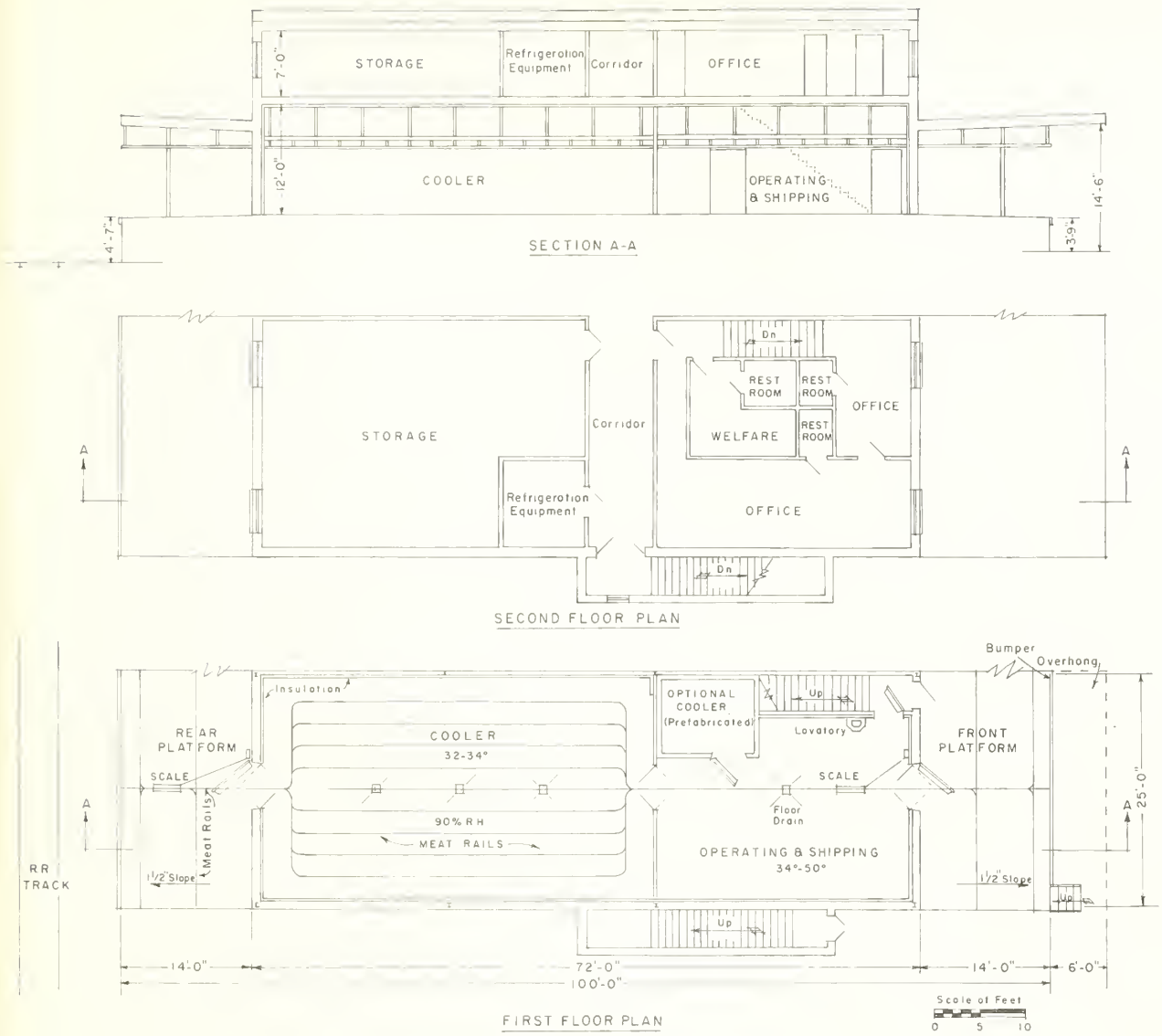

FIGURE 7.—Plan for a meat facility.

would contain 2,100 square feet of enclosed first-floor space, 840 square feet of platforms, 60 square feet for the front and rear walls, and 510 square feet of mezzanine, amounting to 3,510 square feet. Total space in the 3 units is 10,530 square feet.

Platforms at the front and rear of the dairy products and eggs units may be 45 inches high for truck admission to both sides, because only a small amount of dairy products and eggs arrive by rail. But it would be practicable for 3 units to continue the 55-inch height of the adjoining rear platform. Similar considerations would apply to the construction of units for dairy products and eggs, as previously described for multiple-occupancy buildings in general.

The size, shape, and appearance of a general wholesale dealer's facility are shown in figure 8. As there are only three facilities for dairy prod-

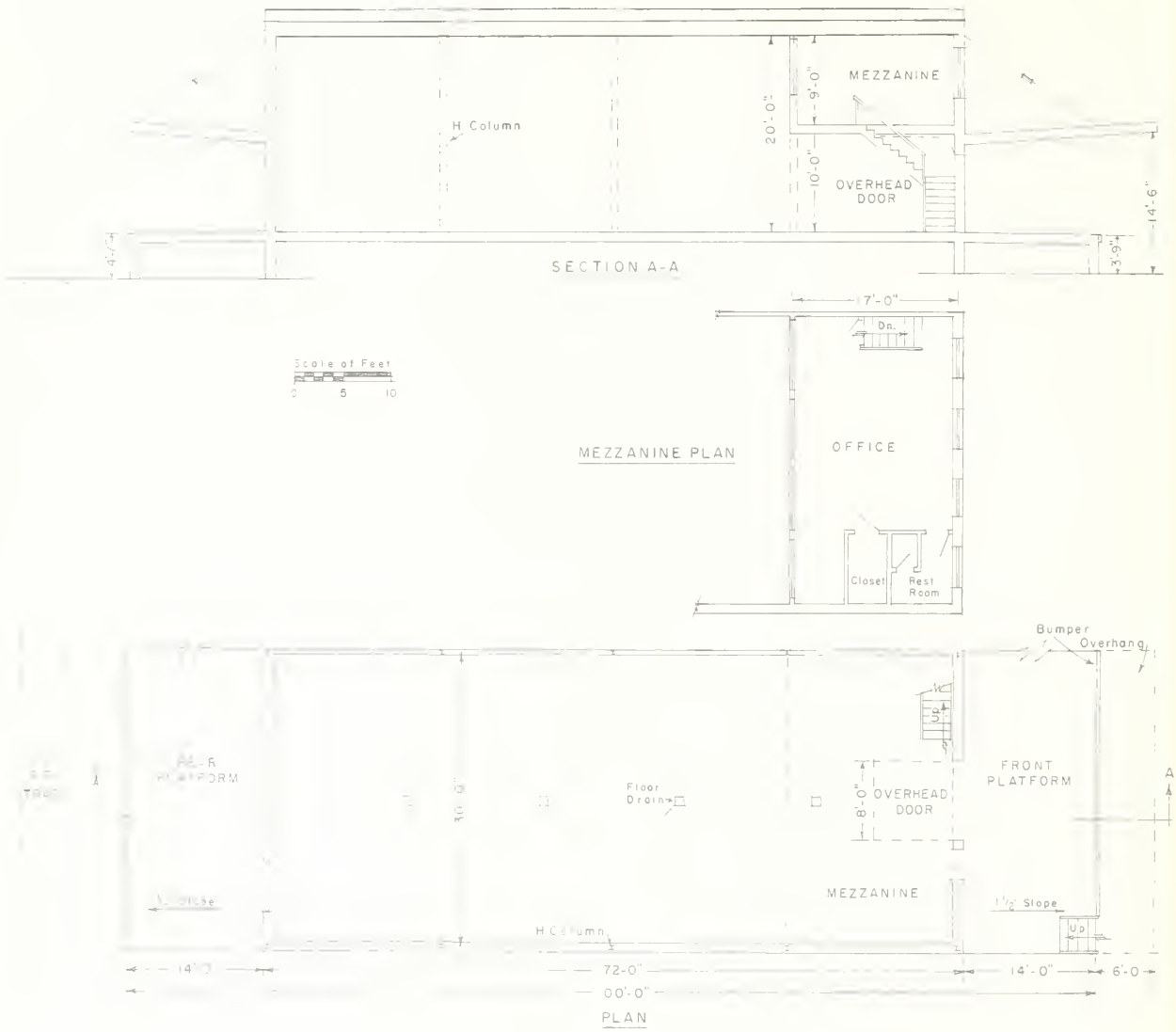

FIGURE 8.—Plan for a single unit dairy products and eggs facility.

ucts and eggs, adaptation of interior arrangement to the handling of butter, cheese, and eggs would be more practical than the provision of specific plans for the different specialties. The installation of equipment and the detailed arrangement would be at the discretion of the operators.

Groceries

Thirteen independent wholesale handlers of groceries would require 55 units in 2 multiple-occupancy buildings. These operators received 41,457 tons of groceries. Two single-occupancy buildings are planned for larger volume independent wholesalers, who handle 36,910 tons, and a warehouse for a food chain that expressed a desire for 48,000 square feet of floor space in the market.

Multiple-Occupancy Buildings

Of the 55 units in the 2 multiple-occupancy buildings, 27 could be included in one building and

28 in the other. Each unit of the multiple-occupancy buildings would be 30 feet wide and 84 feet deep with a 20-foot ceiling height. A covered rear platform of 14 feet, with an additional 2 feet displaced by front and rear walls, would bring the overall depth to 100 feet. The roof over the platform is supported by guy rods for unobstructed handling space.

For nonrefrigerated freight cars used for groceries, the platform height should be 45 inches. The thresholds of the front doors should be 45 inches high, which is a common truckbed height. A wooden bumper strip or standard rubber bumper should protect entrances against truck damage. House tracks should be laid parallel to the rear platform. The front and rear doors should be approximately 8 feet wide (fig. 9).

Removable partitions should be used to allow changes in the amount of space needed by individual wholesalers. All units have mezzanine offices 17 feet deep and 30 feet wide. These offices are placed at the front, above the order-filling operation. This would allow merchandise to be stacked in the holding area at the rear of the store. Order assembling, which does not need a 20-foot ceiling height, could be done in the front of the room, under the mezzanine.

Each unit contains 3,510 square feet: 2,580 square feet of enclosed space on the first floor; 420 square feet on the platform; and 510 square feet in the mezzanine. The 55 units would contain 193,050 square feet.

Single-Occupancy Buildings

The two single-occupancy buildings and the warehouse would be designed and constructed to meet the specifications of occupants.

It is estimated that 18,000 square feet would be required by one firm, 30,000 square feet by another, and 48,000 by a third firm. The overall dimension suggested for the smallest building are 90 feet by 200 feet; for the second building, 150 feet by 200 feet; and for the third, 200 feet by 240 feet.

Frozen Food Stores and Refrigerated Warehouse

A refrigerated warehouse about 230 by 380 feet, with a ceiling height of 20 feet is planned for storing and distributing frozen foods and for other food storage. About one-quarter of the building could house six independent wholesale dealers who distribute 11,678 tons of foods, mostly in frozen form.

This building should be designed and constructed to meet the needs of the manager and other occupants.

Present and Suggested Floor Space for Tenants of Multiple-Occupancy Buildings

The total floor space suggested for the 4 multiple-occupancy buildings containing 97 units for 59 independent dealers is 342,405 square feet, or 72 percent of the space presently used (table 11). Fruit and vegetable dealers could operate with 49 percent of the space now used. Independent meat and related products dealers now use 189,050 square feet of floor space, but only 41 percent of that is suggested. Of the 38,350 square feet of space presently used by the dairy products and egg dealers, only 27 percent is suggested. Grocery dealers would require 156 percent of the 124,065 square feet they now use.

The proposed multiple-occupancy buildings are designed for maximum efficiency in handling the food commodities with a minimum amount of floor space. Many wholesalers in the city desiring a specific amount of floor space in a good location found that they had to take more space than needed, or accept less than needed. Some dealers operated from more than one facility, which resulted in much wasted space at a higher rental cost than necessary. Others used space in public warehouses, which increased cartage and labor costs.

Space in the three proposed single-occupancy grocery buildings, the refrigerated warehouse, the restaurant unit, and the offices above the fruit and vegetable stores, is not shown in the table 11 because there was no comparable space in the facilities studied.

Other Facilities

Direct rail connections should be provided at the rear of the stores occupied by dealers who receive substantial tonnage of products by railroad. At least one house track should be provided at the rear platform of the meat, the grocery, and the refrigerated warehouse facilities, but space should be set aside for a second track if it is desired. Double house tracks are suggested at the rear platforms of all fruit and vegetable stores. No house tracks are needed for the farmers' market because these products arrive by truck.

Streets should be paved in accordance with engineering requirements for carrying heavy traffic. They should slope away from the buildings to insure proper drainage. All parking should be at right angles to the loading platforms. Where two rows of buildings face the same street and center parking is planned, the streets should be at least 200 feet wide. Other streets may vary from 60 to 100 feet in width, depending on their use and the traffic load.

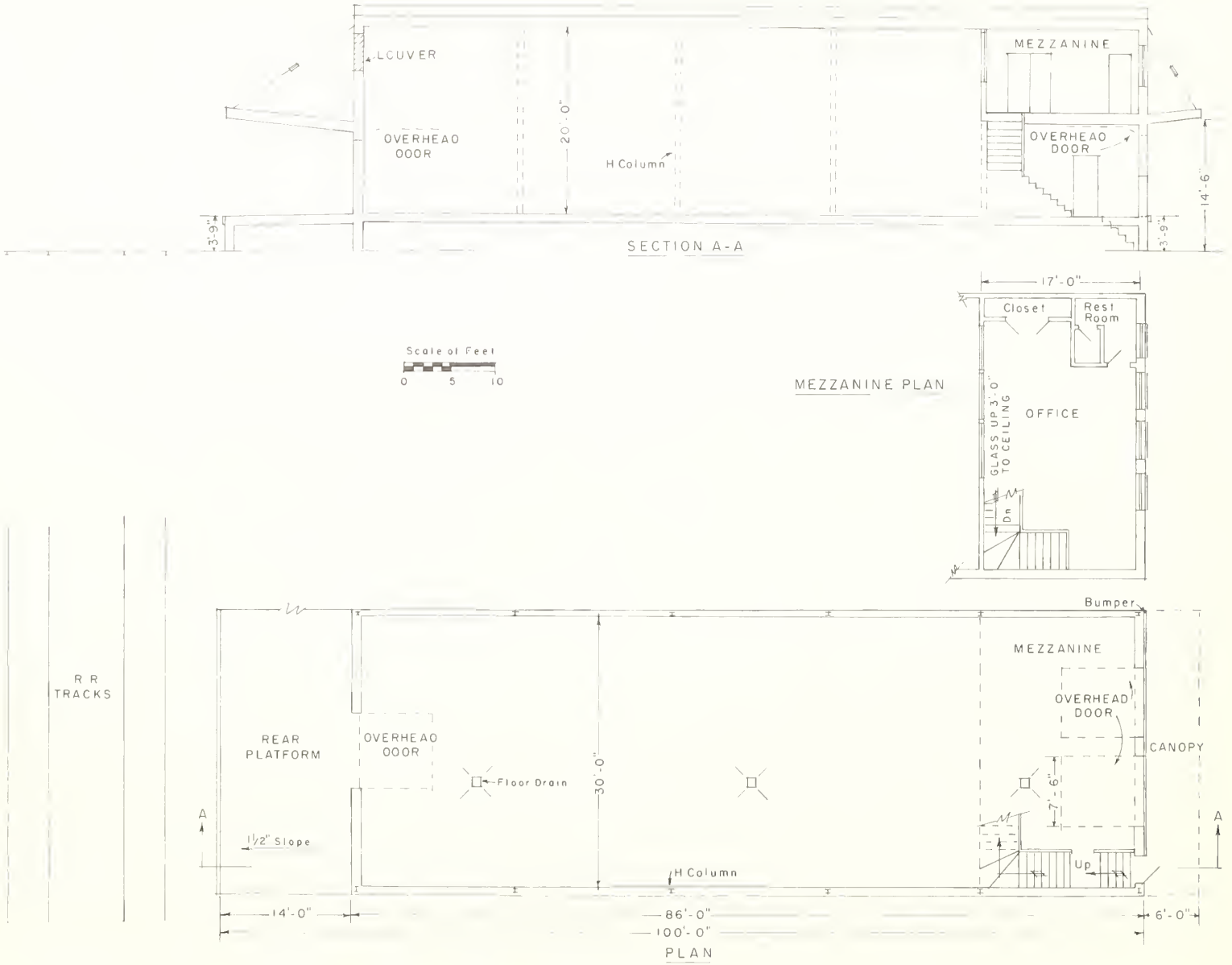

FIGURE 9.—Plan for a single-unit grocery facility.

TABLE 11.—*Floor space used by 59 independent wholesale food dealers and space suggested in multiple-occupancy buildings in the proposed market center, by commodity group*

Commodity group	Dealers included in the plan	Floor area in the facilities studied	Proposed multiple-occupancy buildings			Percent proposed space is of space studied
			Buildings	Units	Floor area [1]	
	Number	*Sq. ft.*	*Number*	*Number*	*Sq. ft.*	*Percent*
Fruits and vegetables	26	125, 140	1	21	61, 425	49
Meat and related products	14	189, 050	1	18	77, 400	41
Dairy products and eggs	6	38, 350	[2]	3	10, 530	27
Groceries	13	124, 065	2	55	193, 050	156
Total	59	476, 605	4	97	342, 405	72

[1] Includes mezzanine and platform space.
[2] Part of meat and related products building.

Convenient paved parking areas should be provided near the stores for cars of market visitors and for vehicles that are not being loaded or unloaded. Parking areas should be as near the buildings as possible, but should not block market streets or loading areas.

Allied industries associated with market activities would probably transfer their offices to a new food center. These would include food brokerage firms, national food processors including canning companies, telegraph or other communications companies, transportation lines, and similar agencies. In addition, space would be needed for the market management, banks, a barber shop, one or two restaurants, and several other service facilities. Transportation firms, distributors, and express companies only partially concerned with food transfer may require facilities in the food center. Twenty-four offices could be provided by adding a second floor to the fruit and vegetable buildings.

Space for two restaurants could be provided. One would be located in a unit of a fruit and vegetable building, as mentioned earlier. The other, a dining-room type, could be located on a highway near the market, along with a gasoline station and garage to accommodate market-connected business as well as nonmarket customers.

Two public restrooms should be provided, one under the restaurant in the fruit and vegetable building and another in an enclosed unit of the farmers' market.

An area for expansion should be reserved at the outset so that more units may be added as needed.

Space should also be provided for allied industries such as bakeries, ice cream and other processing plants, fluid milk and beverage distributors, cartage and transfer companies, general warehousing, and other associated industries. The only restriction that should be placed on location in this area is that the industry be compatible with food industries. In other cities where new wholesale food markets have been built, the trend has been for many types of wholesale food handlers to relocate in the new market area over an extended period. Therefore, sufficient land must be set aside for expansion, if Springfield is to have a central, unified wholesale food distribution center that is adequate for future needs.

A truck repair garage is an asset to a food center site to maintain long distance hauling equipment in good condition at the terminal and reduce the transportation expense chargeable to the movement of market merchandise. A filling station is also needed to service diesel tractor trailers and other motor vehicles.

ARRANGEMENT OF FACILITIES IN THE FOOD DISTRIBUTION CENTER

A food distribution center should be laid out in an industrial park type of development in such a way that the handling operations and the transportation and distribution of supplies will be functionally coordinated.

The designer of a food center should examine the functions to be performed, the volume of the different commodities to be handled, the space required for each type of food, and the efficient method of carrying on wholesale businesses.

To illustrate, a layout on the Gulf site of the facilities previously described is shown in figure 10. This layout is used by request of the Mayor's Community Development Group and other civic committees of Springfield. Its use is not intended to influence the final selection of a market site.

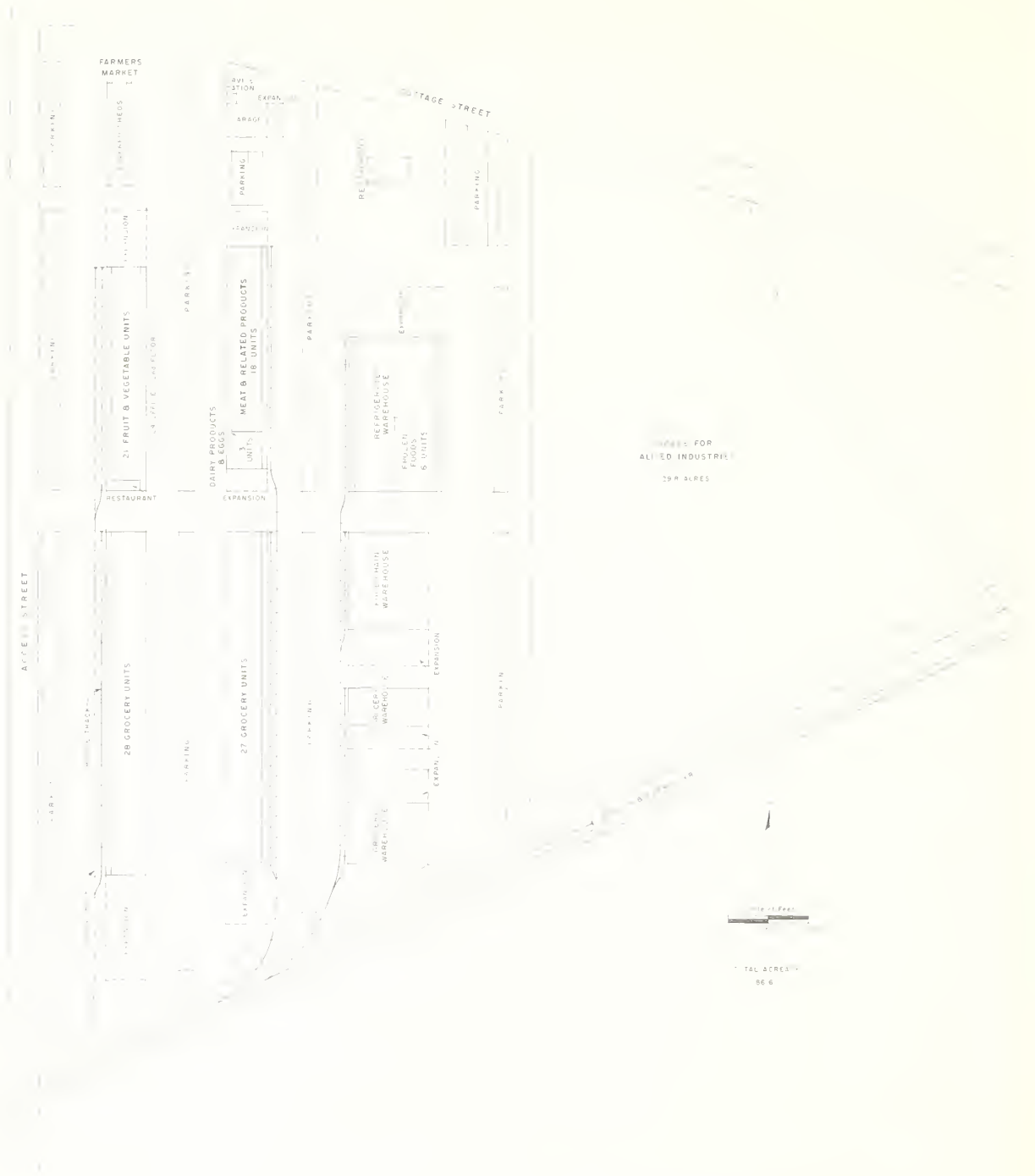

FIGURE 10.—Layout of proposed new facilities on the Gulf site.

The layout has been drawn up in such a way that the facilities initially constructed will form a compact unit and any segment can be expanded without interfering with the unity of any other segment. Buildings have been located so they can be served by rail. The rail spurs have been arranged with a minimum of trackage and switches. The streets have been designed to minimize traffic problems, and an attempt has been made to isolate the site from nonmarket traffic, while at the same time easing the approach of essential traffic to the market.

Businesses selling mostly to buyers shopping in the market have been placed near one another and

convenient to the entrance; those conducting their merchandising largely by delivery of advance orders have been placed apart from heavier traffic.

The center has been subdivided into sections for each commodity group; each section has its own parking space, transportation routes, and other service features, but remains an integral unit within the food center. Expansion areas are indicated for each section. By grouping commodity buildings in this manner, the operations of both buyers and sellers may be facilitated. Further removed is an area for businesses associated with the wholesale food industry, or compatible with it.

The layout may be modified to meet certain easements, eventual tenancy, and other practical requirements of arrangement, but the principles set forth here should be adhered to as closely as possible when any site that may be chosen is being developed.

The objective of the food center design is a one-stop buyers' market. Attention has been devoted to the means for wholesaling all kinds of foods that are usually sold in a retail grocery store. Hence, wholesalers can obtain fill-in items from each other, and there should be little need for the buyers to visit, or receive deliveries from, any markets outside the food center to purchase a complete line. The aim of this plan has been the unification of all marketing and distribution activities. All services necessary for the wholesale food industry are incorporated.

Since the creation of a modern food center requires time, a master plan should be adopted at the outset so that the first buildings constructed will not interfere with the orderly development of the remaining areas. The center must assimilate new enterprises in an orderly fashion, taking care that improper types of businesses and facilities in the present market are not carried into the new food center. It should be planned to meet all needs of sellers and distributors and attract buyers from a greater radius.

Fruit and Vegetable Section

The fruit and vegetable facilities are placed at the edge of the site near the main access road, because much of the business is done through buyers shopping in the market.

A farmers' market, previously described, would be located near the wholesale fruit and vegetable section because the farmers sell much of their produce to these dealers. Parking space is adjacent. No railroad tracks are needed because the growers bring all produce to the market by truck.

Meat and Related Products Section

The area for meat and related products is near the fruit and vegetable section. It is situated to avoid the heavier market traffic. Rail car access is provided to the building. Parking space is provided in the center of the 200-foot street that separates the facing rows of buildings and at the rear of the meat building.

Dairy Products and Eggs Section

The three store units that make up the dairy products and eggs section are designed as a part of the multiple-occupancy building for meat and related products. This is recommended because it is more feasible to house the two commodity groups in one multiple-occupancy building than to construct a separate three-unit building for the dairy products and egg dealers.

Frozen Food and Refrigerated Storage

The building for frozen food dealers and refrigerated storage is adjacent to the meat area, away from the heavy traffic. Six wholesale food handlers could occupy refrigerated units in this building and, consequently, part of this building is similar to a multiple-occupancy building. Rail access is provided by a house track at the rear of the building. Because frozen foods are delivered to retail stores in special refrigerated trucks, there is little or no buyers' truck traffic associated with this facility.

Since the wholesalers who are tenants of the refrigerated warehouse company are largely associated with the meat industry, they are located conveniently to the meat handlers.

Grocery Section

Grocery wholesalers' facilities are across the street from the fruit and vegetable and meat stores and the refrigerated warehouse. These dealers generally deliver to their customers on the basis of orders obtained by salesmen or called in by telephone. Thus, in this location, their delivery trucks will not interfere with heavy market traffic and their operations are little affected by other food center activities. Rail access is provided to each building, and parking spaces are available for employees, buyers, and visitors.

Allied Industries and Other Facilities

The master plan for a wholesale food distribution center should include an area for allied industries. A filling station and garage should be located on a main access road bordering the market to provide service for both market and nonmarket vehicles without congesting traffic within the market.

If a restaurant to serve market and nonmarket patrons is included in the center, it should be near

a main access road. Facilities for cartage firms and long distance transportation companies, manufacturers' branch houses, food processing plants, cooperage firms, general warehousing, restaurant commissaries, and any other business associated with wholesale food handling could be included.

SELECTING A SITE FOR THE FOOD DISTRIBUTION CENTER

Factors To Consider

In choosing a site for the food distribution center, the principal factors to be considered are (1) acreage needed, (2) convenience to retail outlets, (3) direction of population growth, (4) accessibility to truck and rail transportation, (5) convenience to local growers, (6) accessibility of public utilities, and (7) availability and cost of land.

Acreage Needed

The four multiple-occupancy buildings and the farmers' market would require 33.6 acres: 7.6 acres for the fruit and vegetable section, 2.1 acres for the farmers' market, 4.2 acres for the meat and related products section, 1.4 acres for dairy products and eggs, and 18.3 acres for the two multiple-occupancy buildings for groceries.

The two single-occupancy grocery buildings, the refrigerated warehouse, and the food-chain warehouse would need 18.3 acres: 4.1 acres for the large grocery warehouse, 2.3 acres for the smaller grocery warehouse, 7.3 acres for the refrigerated warehouse, and 4.6 acres for the food-chain warehouse.

The filling station and garage would occupy 1.2 acres, and the restaurant 3.7 acres, a total of 4.9 acres.

An additional 29.8 acres would be reserved for allied industries, making a total of 86.6 acres.

Convenience to Retail Outlets

It is essential that a wholesale food distribution center be located as close as possible to a point where a minimum of time is required to deliver to retailers or for retail buyers to reach the market, obtain their supplies, and return to their stores. Thus, the ideal location would be as near as possible to the center of distribution.

Approximately 53 percent of the 624,000 tons of food received during 1962 by wholesale dealers was distributed within the Springfield area. Because retail grocery stores and local restaurants are the major food distributors, their locations were studied in establishing a central distribution point for retail outlets. This center of distribution represents the nearest point to more than 300 stores and restaurants within the study area; it is near the intersection of Federal and Lincoln Streets east of the U.S. Armory.

Direction of Population Growth

The center of population of the area is located on Page Boulevard at Guion Street, about a mile west of Memorial Industrial Park and less than 2 miles northeast of the center of distribution.

According to the 1960 census, the population of the metropolitan area of Springfield was 478,000, an increase of 15.7 percent since 1950. During the 10-year period, the center of population of the study area moved about one block south, which indicates that the population growth is quite evenly distributed in all directions.

Accessibility to Truck and Rail Transportation

Western Massachusetts has a new north-south expressway, Interstate Route 91, and Route 291 will soon be completed. Route 291 will connect the new interstate route with the east-west Massachusetts Turnpike. These routes pass through Springfield and are joined with several radial routes. Because 68.9 percent, or 430,105 tons, of the food arriving in Springfield (table 2) comes by truck, it is important that any site selected be served by access routes that will easily, economically, and speedily place all the commodities on the roads to market.

About 31.1 percent, 193,889 tons, of the food receipts in Springfield arrive by railroad (table 2). Three railway systems meet at a common point in Springfield. All three of these roads will switch cars at a nominal rate. Also, cars destined for a food distribution center from distant shipping points should be delivered at common switching rates regardless of the local switching limits (fig. 11).

Convenience to Local Growers

The western Massachusetts region, which supplied 59,000 tons of foods to the wholesalers in 1962 (table 3) is excellent for the production of truck crops and other farm products. Consequently, the farmers of the area, selling in wholesale quantities, represent an important interest of the proposed food center. The area produces fruits, vegetables, eggs, dairy products, and meats, and possesses the resources for canning, freezing, and manufacturing foods.

Farmers might be willing to travel a little farther to a market that was easily accessible and that was convenient for wholesalers and retailers, if by so doing they could increase their volume of sales.

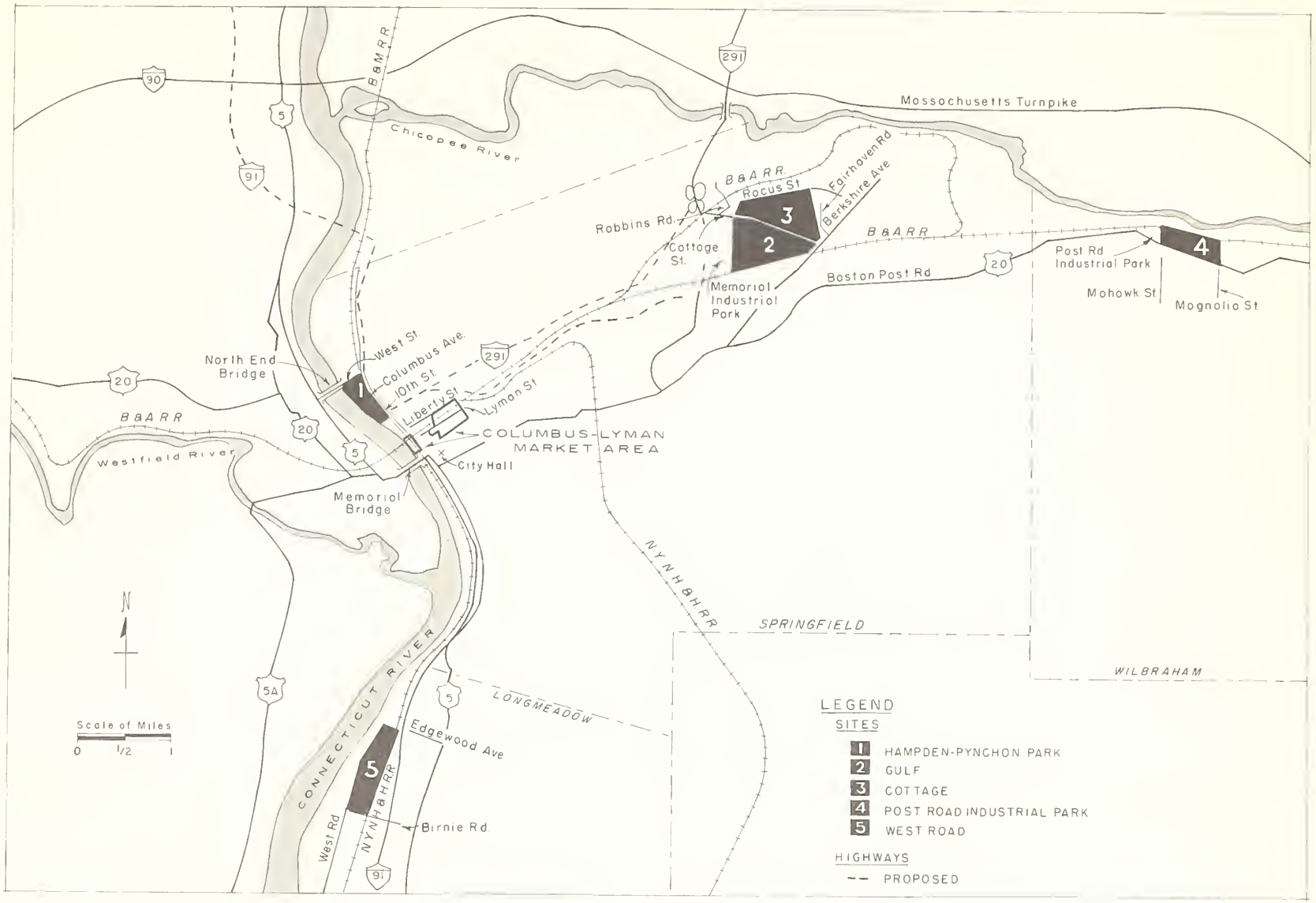

FIGURE 11.—Map of railroad lines and present and proposed traffic arteries in relation to possible sites.

Accessibility of Public Utilities

Availability of public utilities, including electric power, water, gas, and sewage disposal, must be considered in judging the acceptability of a site. If they are all available, it must be known at what point connections can be made, and for a particular public utility, whether the city or the food center corporation must assume the cost. Also, it must be known whether a utility, such as sewer or power line, may present a problem to planning the layout and constructing the market.

Availability and Cost of Land

The cost of land for a food center is a prime measure in choosing a site. This cost includes not only the cost of the land, but also the cost of buying and removing the buildings and other improvements on the site and the filling, grading, and other preparation of the land for construction. It affects the total cost of the food center and the amount of rental income necessary to amortize the investment.

It is essential to obtain sufficient acreage at the initiation of the project for all presently planned and possible future functions. Failure to purchase enough land at the outset could result in an expensive expansion program later.

A sacrifice in convenience of location may be advisable if the price of land would cause rental charges that more than offset any savings in operating costs.

Current land use is an important consideration. A vacant area of the size required, with all the accommodations desired, is usually difficult to find. If the market sponsors decide to locate the food center in the midst of city activities, in spite of high land costs, traffic congestion, insufficient acreage, and many inconveniences, they still have the problems of assembling parcels of land and deciding what is to be done about existing improvements, whether property is to be condemned, and whether one usage is more essential to the public interest than another. If they agree to locate on the outskirts of the city where land is usually cheaper, where less use is made of the land, and where there are more equally acceptable areas, they will have fewer problems in acquiring land and preparing it for building. In any case, the decision of the market sponsors will be based, to a large extent, on the overall cost of acquisition and operation (including debt service charges and taxes).

The topography could be such that the costs of filling and grading, and the costs of the piling would make the site uneconomical. The adaptation of the facilities to the contours, terrain, and limits of the site should be thoroughly investigated.

A rectangular area, with border streets and convenient utilities would be desirable. Unfortunately, such sites are seldom available. The irregular outlines, the obstacles, the presence of brooks and rivers, the directions of streets and roads, the bridges, the turnpike exits, the elevations, and the approach of rail tracks, all affect the layout of facilities. When many of these conditions are extreme, a proper arrangement of facilities is impossible. Much thought should be given to the shape and appearance of the tract and to the costs of constructing a market on a poorly shaped site.

It is necessary to fit the groups of food marketing facilities into an area of similar functions. For this purpose, the city zoning ordinances provide for the proper subdivision of activities into light industrial, commercial, and other categories of usage.

Avoidance of Nonmarket Traffic

The handling of food products through a food center involves a large amount of trucking of heavy and bulky items. When the food industry is located within a commercial area, it is hindered by heavy traffic, much of which is not associated with it, and traffic congestion results. It is necessary to choose a site where the market will be reasonably free of nonmarket traffic and where part of the market may be fenced, if necessary, to lessen such traffic interference.

Sites Evaluated

During the study, several sites were suggested by various persons and organizations. The Planning Board of the city examined all sites herein described and several others that might be acceptable.

There were 20 possible sites considered. Five appear to have much to offer. These are the Hampden-Pynchon Park area at North End Bridge, the Gulf area near Memorial Industrial Park that was used to illustrate the layout of a market (fig. 10), the Cottage Street area adjacent to the Gulf area, the Post Road Industrial Park, and the West Road site. The first three areas mentioned are in the city; the Post Road Industrial Park is in Wilbraham, east of the city limits; and the West Road site is in Longmeadow, south of the city. The order in which the sites are described is not intended to indicate a preference. A summary of the features of the five sites is shown in table 12.

The Hampden-Pynchon Park Site

A variation of the arrangement of facilities could be adapted to the irregular outlines of the Hampden-Pynchon Park site. This tract is in the form of a trapezoid, being narrow at the south end and widest at the North End Bridge.

It is in the city of Springfield. It is bounded on the west by the Connecticut River, on the east by Columbus Avenue, and on the south by 10th Street,

TABLE 12.—*Summary of the features of five sites for a food distribution center*

Item	Hampden-Pynchon Park site	Gulf site	Cottage Street North site	Post Road Industrial Park site	West Road site
Location and boundaries.	At North End Bridge. Bounded on the north by West St., on the east by Columbus Ave., on the south by 10th St., and on the west by the Connecticut River. May extend north, including Lowell St. between Plainfield St. and RR. to Division St.	East of Memorial Industrial Park. Bounded on the north by Cottage St., on the east by Berkshire Ave., on the south by the Boston and Albany RR., and on the west by a property line.	North of Gulf site. Bounded on the north by Rocus St., on the east by a property line west of Fairhaven Rd., on the south by Cottage St., and on the west by a property line east of Robbins Rd.	In Wilbraham. Bounded on the north by the Boston and Albany RR., Athol Branch, on the east by a property line near Magnolia St., on the south by Boston Rd., and on the west by a property line near Mohawk St.	In Longmeadow. Bounded on the north by a property line west of Edgewood Ave., on the east by the New York, New Haven and Hartford RR., on the south by Birnie Rd., and on the west by West Rd.
Land area: Available acres	56 acres readily available. More may be assembled.	86.6 acres readily available. More may be assembled.	143.6 acres	75 acres readily available. More may be assembled.	100 acres.
Estimated land cost per acre.	$16,060	$6,778	$3,851	$3,500	$5,000.
Land use	Recreation park, including grandstand. An additional 44 acres is improved and difficult to procure.	Unimproved	Unimproved	Unimproved	Unimproved.
Access to rail transportation.	New York, New Haven & Hartford, east side; Boston & Albany, south side; Boston & Maine, north end.	Boston and Albany main line, south side; Boston & Albany Athol Branch near north side; New York, New Haven & Hartford, 3 miles west; Boston & Maine, 4 miles west.	Boston & Albany Athol Branch, north side and main line near south side; New York, New Haven & Hartford, 3 miles west.	Boston & Albany, north side; New York, New Haven & Hartford, 7 miles west; and Boston & Maine, 8 miles west.	New York, New Haven & Hartford, east side; Boston & Albany, 4 miles, and Boston & Maine, 5 miles north.
Convenience to highways.	Interstate Route 91 and Columbus Ave. on east side; North End Bridge and West St. at north end; and Memorial Bridge near south.	Cottage St. on north side and Berkshire Ave. at east end. Interstate Route 291, ½ mile west. Mass. Turnpike, 1½ miles north. Interstate Route 91, 4 miles west.	Cottage St. on south side and Rocus St. on north side. Interstate Route 291, ½ mile west; Interstate Route 91, 4 miles west. Mass. Turnpike, 1 mile north.	Boston (Post) Rd., on south side, is the only access road.	West Rd. on the west side and Pondside Rd. near the east side along the railroad tracks. Emerson St. at the north end and Birnie Rd. at the south end.
Convenience to retailers.	1½ miles west of the center of distribution.	3 miles northeast of center of distribution.	3½ miles northeast of center of distribution.	7½ miles northeast of center of distribution.	4 miles south of the center of distribution.

and it extends north to West Street or North End Bridge. This location is at the approximate center of the city's industrial and merchandising activities. Such a location would be better for a number of industries, other than food distribution, that cater to the general public.

The site contains 56 available acres but would consist of about 100 acres if fully extended northward between the railroad tracks and Plainfield Street to Division Street. The available acreage contains enough land for the facilities now needed, provided some of the parking space is sacrificed. Later, if more acreage were obtained, the shape and location would not be conducive to the application of market planning principles. The tract has several good features however, chief of which is it is level and separated from heavy metropolitan traffic. It is in a lowland area, but a high earthen dike and flood control measures have substantially reduced the hazard of flooding.

It is adjacent to the three main railroads and to Interstate Route 91 and 4 miles from the Massachusetts Turnpike via the North End Bridge or the Memorial Bridge. It has good access to the Columbus Avenue service road of Route 91 and is 1½ miles west of the center of distribution. All public utilities are available. When placed in condition to build on, its estimated value would be about $16,060 per acre.

The Gulf Site

The Gulf site is in Springfield. It is bounded by a property line near the Springfield Gas Company on the west, Cottage Street on the north, Berkshire Avenue on the east, and the Boston and Albany main line of the New York Central System on the south. Although it is one mile beyond the switching limits, or the point where the moderate switching fees prevail, it is understood the railroad agrees that the higher switching rates on freight destined beyond such limits will not apply. The current status and legality of this agreement with regard to Interstate Commerce Commission rules should be examined carefully.

The land is partly low and swampy in places and slightly hilly in others. It should be a simple matter to level and grade the area at little cost.

Rail access can be provided easily from the Boston and Albany main line on the south side of the site and possibly from the Athol branch of the same railroad near the north side of the tract.

Major arterial highway access is excellent. The interchange of new Interstate Route 291 with the planned Interstate Connector, would lie just north of the site at Cottage Street and Roosevelt Boulevard. The Massachusetts Turnpike, 1½ miles to the north, will have a junction with Interstate Route 91 about 4 miles west of the site.

The shape of the tract is adaptable for a market. This site is satisfactorily located 3 miles northeast of the center of distribution. All public utilities are available. There are about 86 acres readily available, and it is possible that a total of about 100 acres that is unencumbered by any improvements could be acquired.

It is estimated that sufficient acreage could be placed in condition for construction for about $6,800 per acre. This site is economically suitable for a market center.

The Cottage Street Site

This possible site, just across Cottage Street, north of the Gulf site, has nearly all the assets of the Gulf site. It is bounded on the west by a property line near Robbins Road, on the north by Rocus Street, on the east by a property line near Fairhaven Road, and on the south by Cottage Street. The land is partly low and hilly, but grading would be sufficient with no other fill required.

Rail access to the site is available via the Boston and Albany mainline at the southeast corner and by the Athol Branch at the northeast corner. Placing of freight cars via the branch line would usually be one day later than by the mainline.

Access from the expressway and other roads is good. The tract is 3½ miles northeast of the center of distribution, and all public utilities are available. There are 143.6 acres in the site, of which 100 unimproved acres are readily available. When placed in condition for building, it is estimated that the land value would be about $3,850 per acre.

Post Road Industrial Park

The industrial park on the Boston (Post) Road in Wilbraham, 8 miles northeast of the Springfield City Hall, contains only 75 available acres. This would satisfy the immediate needs for planned facilities, but would fail to accommodate all prospective allied industries. An additional 25 acres of unimproved land could possibly be obtained that would provide sufficient acreage for future needs.

This tract is bounded on the north by the Boston and Albany Railroad (Athol Branch), on the east by a line with Magnolia Street, on the south by Boston Road, and on the west by a line with Mohawk Street.

The land is level and unimproved. Very little grading would be necessary.

Access by rail and highways is adequate. The Boston and Albany Railroad would serve the site on the north, and the Boston (Post) Road on the south would provide the only other access. The site is 7½ miles from the center of distribution.

There are no storm or sanitary sewer systems near the tract, but other public utilities are available. It is estimated that the value of the land, when ready to build on, would be about $3,500 per acre.

The West Road Site

The West Road site, in Longmeadow, is 4 miles south of Springfield's City Hall. It is bounded on

the north by a property line west of Edgewood Avenue, on the east by the New York, New Haven and Hartford Railroad, on the south by Birnie Road, and on the west by West Road.

The site contains 100 acres of unimproved land. The land is almost level, but it may be subject to flooding under unusual conditions; and it requires substantial fill. There is convenient access to the site by rail; the New York, New Haven and Hartford mainline borders the site on the east. Interstate Route 91 touches the site at the northern edge, and other local road networks are nearby. All public utilities are available.

This tract, when readied for construction, has an estimated value of $5,000 per acre. It is 4 miles from the center of distribution. Two main objections to this location are that it is only 25 miles from the Hartford regional market and that Longmeadow, a residential suburban community, does not encourage industrial or commercial development.

Other Sites

Fifteen other sites were examined, all of which were 5 to 8 miles from the central part of the city. The acreage in these tracts ranged from 75 to 100 acres each. Some were almost level and others were quite hilly. Four of the sites had excellent highway access; seven had good to fair access; and access to the other four was poor. Eleven of the tracts had main line or rail spur access and four had none. All public utilities were available on only six of these sites.

ESTIMATED INVESTMENT COSTS OF LAND AND FACILITIES

Funds required for acquiring the site and putting it in condition to build will vary according to the characteristics of the site chosen. This section deals with the cost of the land and facilities for the Gulf site, as explained in a preceding chapter. It is assumed that private funds may be used for the acquisition and development of the land.

These estimates do not include costs for any additional facilities that may be built later in the expansion areas, or the costs of access streets, water mains, and sewers, which are usually borne by the city. The cost estimates shown are only those involved in placing the total site in condition to build and constructing the wholesale food facilities that have been determined to be needed.

Land

The estimated cost of land for the three sites that are located in the city is given in table 13. Land costs are based on assessed valuation of the land and the present structures thereon, the estimated cost of acquiring and developing the site, and an estimated cost for grading and fill. The estimated per-acre land costs for the three sites are Hampden-Pynchon Park, $16,060; Gulf area, $6,778; and Cottage Street North, $3,851.

The assessed valuation of this land was estimated to be 85 percent of the market value, according to a study by the U.S. Bureau of the Census (Census of Governments, 1962, Vol. 2, "Taxable Property Values and Estimates of the Local Government") and estimates of local real estate developers. This assessed valuation was adjusted to 100 percent to obtain an estimated market value. Acquisition and development costs include legal and engineering fees, damages, demolishment, and clearing costs. Costs for grading and fill are predicated upon the estimated cubic yards of dirt required to raise low land and reduce high land.

Facilities

The estimated costs of buildings and other facilities (exclusive of land) are based on indices of

TABLE 13.—*Acres available and cost for 100 acres at three possible sites in Springfield for proposed food distribution center*

Site	Land available	Present cost of land and improvements [1]	Acquisition and development	Grading and fill	Total cost	Average cost per acre	Total cost for 100-acre site
	Acres	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*Dollars*	*1,000 dollars*
Hampden-Pynchon	100. 0	1, 287	219	100	1, 606	16, 060	1, 606
Gulf area	101. 5	371	63	254	688	6, 778	678
Cottage Street North	143. 6	165	28	360	553	3, 851	385

[1] Based on assessed valuation estimated to be 85 percent of market value of land and improvements.

costs of construction in Springfield in December 1963 and costs of constructing similar facilities in comparable areas.

Construction costs include plumbing, floor drainage, and electric wiring, and construction of the building shells. It was assumed that any wholesalers requiring refrigerated or controlled atmosphere rooms would construct them and install temperature control equipment to suit their individual needs.

Paving costs are based on estimates provided by the Federal Bureau of Public Roads for 1963 on costs of a 2-inch asphaltic concrete or a 4-inch macadam surface and a 7-inch gravel foundation.

The following estimates should be used only as a guide in arriving at a total estimated cost for the project; these costs are NOT intended to replace firm estimates made by local architects and contractors at the time the construction is undertaken. Obviously, local estimates of costs, based on a food distribution center on a particular site, may differ from the following estimates, which are calculated for the Gulf site.

The facility cost estimates are based on brick and steel construction. (Architect's and engineer's fees at 6 percent of construction costs, a construction loan at 5 percent of construction costs, including architect's and engineer's fees, and a 10 percent contingency cost are included.) These costs are shown in the following tabulations together with the estimated investment costs for individual facilities and for the commodity sections of the center.

Fruit and Vegetable Section

Multiple-occupancy building:	
Standard store units:	
21 (in one building): 25 ft. x 100 ft. with 17 ft. x 25 ft. mezzanines, 52,500 sq. ft. 1st floor and platform space, and 8,925 sq. ft. mezzanine space, $19,875 per unit	$417,375
Restaurant in one additional unit	19,875
Restrooms under restaurant	2,500
24 offices on 2d floor, 10,500 sq. ft. light office construction @ $5.50 per sq. ft	57,750
Total construction cost of this building	497,500
Other facilities for this building:	
Trackage:[1]	
House and lead-in tracks, 2,150 ft. @ $15	32,250
Switches, single, 2 @ $2,500	5,000
Paving (bituminous concrete): 31,640 sq. yd. @ $3.50	110,740
Sewers:	
15-in. storm 1,400 ft. @ $3.50	4,900
12-in. sanitary, 700 ft. @ $2.25	1,575
Floodlights: 8 @ $150	1,200
Public address system	450
Total construction cost of other facilities	156,115
Total construction costs	653,615
Other costs:	
Architect and engineering fees, 6% of construction cost	39,217
Construction loan, 5% of construction cost and architect's and enigneering fees	34,642
Contingency, 10% of construction costs, fees and loan	$72,747
Total investment costs of above facilities	800,221
Land; 7.6 acres @ $6,778	51,513
Total investment costs of land and facilities	851,734
Farmers' market:	
Covered stalls: 50 (10 ft. x 12 ft., including step).	
6,000 sq. ft. @ $1.25	7,500
Enclosure of 2 stalls for office and restroom fixtures	1,200
Total construction cost of these buildings	8,700
Other facilities for the farmers' market:	
Paving (blacktop combination) 9,400 sq. yd. @ 3.50	32,900
Sewers:	
15-in. storm, 750 ft. @ $3.50	2,625
12-in. sanitary, 250 ft. @ $2.25	563
Floodlights: 6 @ $150	900
Total construction cost of other facilities	36,988
Total construction costs	45,688
Other costs:	
Architect and engineering fees, 6% of construction costs	2,741
Construction loan, 5% of construction costs and architect's and engineer's fees	2,421
Contingency, 10% of construction costs, fees, and loan	5,085
Total investment costs of above facilities	55,935
Land, 2.1 acres @ $6,778	14,234
Total investment costs of land and facilities	70,169

Meat and Related Products Section

Multiple-occupancy building:	
Standard store units:[2]	
18 (in one building): 25 ft. x 100 ft. on 1st floor and 25 ft. x 72 ft. on 2d floor, 45,000 sq. ft. of 1st floor and platform space and 32,400 sq. ft. of 2d floor space @ $20,697 per unit	$372,546
Meat rails installed with trackage for platforms @ $450 per unit	8,100
Total construction cost of this building	380,646
Other facilities for this building:	
Trackage:	
House and lead-in tracks, 1,450 ft. @ $15	21,750
Switches 1 @ $2,500	2,500
Paving (bituminous concrete): 14,200 sq. yd., @ $3.50	49,700
Sewers:	
15-in. storm, 1,100 ft. @ $3.50	3,850
12-in. sanitary, 550 ft. @ $2.25	1,238
Floodlights: 6 @ $150	900
Total construction cost of other facilities	79,938
Total construction costs	460,584
Other costs:	
Architect and engineering fees, 6% of construction costs	27,635

See footnotes on page 36.

Multiple-occupancy building—Continued	
Other costs—Continued	
Construction loan, 5% of construction costs and architect's and engineer's fees	$24,410
Contingency, 10% of construction costs, fees, and loan	51,263
Total investment costs of above facilities	563,892
Land, 4.2 acres @ $6,778	28,468
Total investment costs of land and facilities	592,360

Dairy Products and Eggs Section

Multiple-occupancy stores:	
Standard store units:	
3 (in one building): 30 ft. x 100 ft. with 17 ft. x 30 ft. mezzanines, 9,000 sq. ft. 1st floor and platform space, and 1,530 sq. ft. mezzanine space, $23,850 per unit	$71,550
Other facilities for this building:	
Paving (bituminous concrete): 5,000 sq. yd. @ $3.50	17,500
Sewers:	
15-in. storm, 200 ft. @ $3.50	700
12-in. sanitary, 100 ft. @ $2.25	225
Floodlights: 3 @ $150	450
Total construction cost of other facilities	18,875
Total construction costs	90,425
Other costs:	
Architect and engineering fees, 6% of construction costs	5,425
Construction loan, 5% of construction costs and architect's and engineer's fees	4,793
Contingency, 10% of construction costs, fees, and loan	10,064
Total investment cost of above facilities	110,707
Land, 1.4 acres @ $6,778	9,489
Total investment costs of land and facilities	120,196

Groceries Section

Multiple-occupancy buildings:	
Standard store units:	
55 (in 2 buildings): 30 ft. x 100 ft. with 17 ft. x 30 ft. mezzanines, 165,000 sq. ft. 1st floor and platform space and 28,050 sq. ft. mezzanine, $23,850 per unit	$1,311,750
Other facilities for these buildings:	
Trackage:	
House and lead-in tracks, 2,400 ft. @ $15	36,000
Paving (bituminous concrete): 65,840 sq. yd. @ $3.50	230,440
Sewers:	
15-in. storm, 2,480 ft. @ $3.50	8,680
12-in. sanitary, 1,250 ft. @ $2.25	2,812
Floodlights: 26 @ $150	3,900
Total construction cost of other facilities	281,832
Total construction costs	1,593,582
Other costs:	
Architect and engineering fees, 6% of construction costs	95,615
Construction loan, 5% of construction costs and architect's and engineer's fees	84,460
Contingency, 10% of construction costs, fees and loans	$177,366
Total investment cost of above facilities	1,951,023
Land, 18.3 acres @ $6,778	124,037
Total investment costs of these facilities	2,075,060
Single-occupancy buildings:	
Independent wholesalers:	
1 building on 2.3 acres: 200 ft. x 90 ft., 1st floor space, 18,000 sq. ft.	
1 building, on 4.1 acres: 200 ft. x 150 ft., 1st floor space, 30,000 sq. ft.	
1st floor space, 2 buildings 48,000 sq. ft. @ $7.95	381,600
2d floor space 90 ft. x 100 ft. and 20 ft. x 150 ft., 12,000 sq. ft. heavy warehouse construction @ $7.95	95,400
Total construction cost of these buildings	477,000
Other facilities for these buildings:	
Trackage:	
House and lead-in, 900 ft. @ $15	13,500
Switches, 1 @ $2,500	2,500
Paving (bituminous concrete): 22,667 sq. yd. @ $3.50	79,335
Sewers:	
15-in. storm, 425 ft. @ $3.50	1,488
12-in. sanitary, 400 ft. @ $2.25	900
Floodlights: 7 @ $150	1,050
Total construction costs of other facilities	98,773
Total construction costs	575,773
Other costs:	
Architect and engineering fees, 6% of construction costs	34,546
Construction loan, 5% of construction costs and architect's and engineer's fees	30,516
Contingency, 10% of construction costs, fees, and loan	64,084
Total investment cost of above facilities	704,919
Land, 6.4 acres at $6,778	43,379
Total investment costs of land and facilities	748,298

Food-Chain Warehouse

1 building, 48,000 sq. ft., 200 ft. x 240 ft.	
1st floor space, 48,000 sq. ft. @ $7.95	$381,600
Mezzanine space, 20 ft. x 240 ft., 4,800 sq. ft. (heavy warehouse construction) @ $7.95	38,160
Total construction cost of this building	419,760
Other facilities for this building:	
Trackage:	
Lead-in and house, 520 ft. @ $15	7,800
Switches, 1 @ $2,500	2,500
Paving (bituminous concrete): 14,700 sq. yd. @ $3.50	51,450
Sewers:	
15-in. storm, 425 ft. @ $3.50	1,488
12-in. sanitary, 400 ft. @ $2.25	900

Other facilities for this building—Continued	
Floodlights: 5 @ $150	$750
Total construction cost of other facilities	64,888
Total construction costs	484,648
Other costs:	
Architect and engineering fees, 6% of construction costs	29,079
Construction loan, 5% of construction costs and architect's and engineer's fees	25,686
Contingency, 10% of construction costs, fees, and loans	53,941
Total investment cost of above facilities	593,354
Land, 4.6 acres @ $6,778	31,179
Total investment cost of land and facilities	624,533

Refrigerated Warehouse

1 building, 87,400 sq. ft., 380 ft. x 230 ft.	
Freezer area: —10° F., 692,000 cu. ft. @ $1.20 [3]	$830,400
Cooler area: 35° F., 653,750 cu. ft. @ $1.05 [3]	686,437
Unrefrigerated areas: Machinery room, 1,500 sq. ft.; administrative and dispatching office, 900 sq. ft.; wholesale dealers' sales and service rooms, 5,400 sq. ft.; accounting offices above the sales and service rooms and administrative and dispatching office, 6,300 sq. ft.; total—14,100 sq. ft. @ $7.95	112,095
Total construction cost of this building	1,628,932
Other facilities for this building:	
Trackage: Lead-in and house tracks, 750 ft. @ $15	11,250
Paving (bituminous concrete): 22,770 sq. yd. @ $3.50	79,695
Sewers:	
15-in. storm, 420 ft. @ $3.50	1,470
12-in. sanitary, 210 ft. @ $2.25	472
Floodlights: 4 @ $150	600
Total construction cost of other facilities	93,487
Total construction costs	1,722,419
Other costs:	
Architect and engineering fees, 6% of construction costs	103,345
Construction loan, 5% of construction costs and architect's and engineer's fees	91,288
Contingency, 10% of construction costs, fees, and loan	191,705
Total investment costs of above facilities	2,108,757
Land, 7.3 acres @ $6,778	49,479
Total investment cost of land and facilities	2,158,236

Service Facilities

Truck service and restaurant facilities:	
Filling station, 20 ft. x 20 ft., 400 sq. ft. @ $15	$6,000
Repair garage, 80 ft. x 100 ft., 8,000 sq. ft. @ $7.25	58,000
Roadside steak house, 60 ft. x 100 ft., 6,000 sq. ft. @ $30 (including structure, decoration, and fixed equipment)	180,000
Total construction cost of these buildings	244,000
Other facilities for these buildings:	
Paving (bituminous concrete):	
Filling station and garage on 1.2 acres, 4,730 sq. yd. @ $3.50	16,555
Dining facility on 3.7 acres, 17,000 sq. yd. @ $3.50	59,500
Sewers:	
15-in. storm, 350 ft. @ $3.50	1,225
12-in. sanitary, 200 ft. @ $2.25	450
Floodlights: 10 @ $150	1,500
Total construction cost of other facilities	79,230
Total construction costs	323,230
Other costs:	
Architect and engineering fees, 6% of construction costs	19,394
Construction loan, 5% of construction costs and architect's and engineer's fees	17,131
Contingency, 10% of construction costs, fees, and loan	35,976
Total investment cost of above facilities	395,731
Land, 4.9 acres @ $6,778	33,212
Total investment costs for land and facilities	428,943

[1] Trackage and other railroad equipment costs are based on estimates of the New York Central system.

[2] Since requirements of individual meat wholesale handlers will vary, interior meat rails, costing about $7,500 per unit, and insulation for 3,832 sq. ft. per unit are not included. These costs amount to an estimated $18,996 per unit, additional cost.

[3] The cost per cubic foot for freezer and cooler space includes refrigeration equipment and machinery, insulation, and all of the building except the enclosed unrefrigerated rooms.

A summary of the estimated investment costs for land and facilities for a market on the Gulf site is shown in table 14. The total of the estimated costs for all the facilities previously described would amount to about $7,284,400. The cost for 86.6 acres of land is estimated at $587,000, making a total cost for the market of about $7,871,400.

The cost for the land and the multiple-occupancy buildings planned for the 59 independent wholesalers would amount to about $3,639,300.

TABLE 14.—*Summary of estimated investment costs of land and facilities, by commodity group and type of facility, on the Gulf site*

Type of facility and commodity group	Land		Facilities	Total
	Acres	Cost [1]		
		1,000 *dollars*	1,000 *dollars*	1,000 *dollars*
Multiple-occupancy buildings:				
Fruits and vegetables	7.6	51.5	800.2	851.7
Meat and related products	4.2	28.5	563.9	592.4
Dairy products and eggs	1.4	9.5	110.7	120.2
Groceries	18.3	124.0	1,951.0	2,075.0
Total	31.5	213.5	3,425.8	3,639.3
Farmers' market	2.1	14.2	55.9	70.1
Single-occupancy buildings:				
Independent grocery wholesalers	6.4	43.4	704.9	748.3
Food-chain warehouse	4.6	31.2	593.3	624.5
Total	11.0	74.6	1,298.2	1,372.8
Refrigerated warehouse	7.3	49.5	2,108.8	2,158.3
Service facilities	4.9	33.2	395.7	428.9
Total for planned facilities	56.8	385.0	7,284.4	7,669.4
Allied industry area	29.8	202.0	0	202.0
Grand total	86.6	587.0	7,284.4	7,871.4

[1] Cost of land is based on $6,778 per acre.

OWNERSHIP AND MANAGEMENT OF A WHOLESALE FOOD CENTER

There are many ways to finance and operate a wholesale food center.[1] Such projects have been handled by (1) private corporations, (2) public benefit corporations, (3) direct public ownership, and (4) a combination of these.

Private Corporations

The primary advantage of corporate ownership is that the owners have complete control over operations, subject only to generalized legal restrictions. In addition, when the period of amortization expires, the entire investment belongs to the stockholders; tenancy changes have no effect upon stock ownership; and transfer of stock is unrestricted. The major problem of corporate ownership of a food center is that a substantial financial equity is necessary.

When a private corporation is operated on a nonprofit basis, the sale of shares of voting stock usually is restricted. A nonprofit market corporation probably would restrict the sale of this stock to farmers, truckers, wholesalers, and others directly concerned with the operation of the market, and would base the amount of stock sold to one individual or firm on the amount of facilities used. In some cases, eligible purchasers of voting stock also would be required to purchase a specified number of shares of nonvoting stock. Through these restrictions on stock sales, the number of stockholders' votes and the voice in management exercised by any one shareholder are limited. Under the laws in some States, nonprofit corporations are variously referred to as cooperative corporations or as societies.

A number of wholesale markets are owned and operated by private corporations. In some instances, the principal stockholders in these corporations are food wholesalers. In others, the corporation is a railroad company or some other company organized primarily for another type of business. Most of the large terminal produce markets built in the 1920's were sponsored by railroad companies that believed that such markets would increase the volume handled by their lines.

[1] For more information on types of ownership and methods of financing wholesale food market facilities, see Clowes, H. G., Elliott, W. H., and Crow, W. C. WHOLESALE FOOD MARKET FACILITIES—TYPES OF OWNERSHIP AND METHODS OF FINANCING, U.S. Dept. Agr. Mktg. Res. Rpt. No. 160, 96 pp., illus. 1957.

Public Benefit Corporations

Market authorities are usually organized as public benefit corporations. This type of organization offers some desirable features not found in some other types of ownership. It differs from nonprofit private corporations only in that public benefit corporations are usually publicly owned.

A public benefit corporation is a nonprofit agency. As such, rentals and other charges do not exceed the amount needed to pay the costs of operation, amortize the original investment, and maintain a limited reserve for contingencies. The reserve funds cannot be paid to lessees as dividends because under public ownership the revenues would be considered as public funds. However, there is the possibility that reserves of funds might be appropriated for other public uses while bonds remained outstanding, unless such reserves were specifically committed to redemption of bonds.

Market authorities usually have the power of eminent domain, which can be useful in the acquisition of a site. Such corporations usually finance market improvements through the sale of revenue bonds. This type of financing normally is not a full obligation of a State or a political subdivision. Since these revenue bonds are often tax exempt, the interest cost is lower than for other ways of financing. However, even if this is not the case, the bonds of a State or political subdivision usually have such established credit ratings that the sale of the bonds at favorable rates is possible.

A public agency, such as a market authority, is more likely than some types of private ownership to provide for future expansion and to work toward the establishment of a complete wholesale food distribution center. A market authority may or may not be required to pay taxes to the community in which it is located.

Market authorities also have certain limitations, especially with respect to the financing and management of the facilities. For example, one of their most serious limitations is their inability to raise funds for capital improvements, except through the sale of revenue bonds. To overcome this limitation, some State or city governments have appropriated part of the funds needed for land acquisition and original construction. As a rule, a market authority must have either equity funds or State (or city) responsibility for its loans. The continuity of management on some markets has depended on the continuance of a State or municipal government administration in office. As a whole, market authorities do not have as complete freedom of operation as is possible under private ownership.

Direct Public Ownership

Some wholesale food market facilities have been financed, constructed, and operated by States, counties, or municipalities. Several States and a number of municipalities have enabling legislation covering the improvement or establishment of produce markets.

Direct State ownership and operation of a wholesale market facility usually can be differentiated from ownership and operation by a State market authority by the methods of financing used and the delegation of authority made by the State legislature. Although a number of States have appropriated funds for, and otherwise assisted market authorities with, financial problems, they do not usually underwrite the total cost of a market constructed by an authority. Nor have the States usually assumed responsibility for the operation of these markets after they were constructed. With direct State ownership, a market facility is financed in whole or in greater part by an appropriation of State funds. If the financing is not entirely by this method, the State usually is obligated for the remainder unless this balance is obtained through grants or donations. Also, the State is responsible for maintenance and other expense involved in the operation of a State-owned market.

Municipal or county ownership of a wholesale produce market is comparable in many of its basic aspects to direct State ownership. Some municipalities are authorized in their charters to construct and operate food markets. However, some city councils or commissions are not authorized to make appropriations from general funds in the city treasury for the construction of market facilities on a basis comparable to that of a State legislative body. Three methods are usually open to municipalities for financing a market program: (1) Issuance of municipal bonds, (2) issuance of revenue warrants, and (3) loans from public corporations. In many cities the issuance of bonds for such purposes must be approved by a majority of the qualified electorate voting in a referendum.

Facilties constructed with municipal or county funds would necessarily be owned by the county or municipality, and rent would have to be paid by the tenants indefinitely.

Combinations

Wholesale food markets have been established combining two or more of the types of ownership and operation previously discussed. For example, in Philadelphia, a food center was built by a nonprofit organization on land owned and put in condition for building by the city. This corporation built and leased some buildings, but most of the individual occupancy buildings are privately owned.

In Springfield, it may be convenient to use two or more of these methods to finance a food center. The entire food center would be constructed and

operated by a single agency, or various parts could be constructed and operated by different agencies. To illustrate: The farmers' market area could be constructed and operated by a cooperative; multiple-occupancy buildings could be constructed and operated by some other arrangement; and the buildings wholly occupied by one firm could be financed in a third way.

ESTIMATED ANNUAL COSTS AND REVENUE REQUIREMENTS

The annual costs of operating the food distribution center include: (1) Debt service on the investment in land and facilities, (2) real estate taxes, and (3) cost of management of the facilities, including personnel services and office expenses, maintenance, and insurance costs. Total annual revenue required also is discussed in this section.

For the purpose of this study, it is assumed that a Greater Springfield food market organization will deal with general policy matters in developing and operating the center.

It is understood that the farmers' market cooperative will continue to operate the farmers' market. Hence, the debt service charges on land and facilities, real estate taxes, costs of management, and total revenue required for this part of the food center are not computed.

It is also assumed that the single-occupancy grocery buildings, the food-chain warehouse, the refrigerated warehouse, and the service facilities would be designed and financed according to the desires of each individual occupant or manager. The land needed for each of these facilities could be purchased, or leased, from the Greater Springfield food market organization, and the type of construction and location of the facilities should conform to the master plan of the food distribution center.

The market charges and total revenue requirements are computed only for the multiple-occupancy area of the market in this section, under the assumption that it will be financed by a private corporation without subsidy.

Debt Service Payments

The period over which the investment in land and facilities should be amortized is determined by several factors. Observations on markets in other cities indicate that these facilities, if properly designed and operated, should not become fully depreciated or obsolete in less than 25 or 30 years. Most market facilities are used for a much longer period. Usually, loan agencies have such loans repaid over a 25- to 30-year period, either in equal installments or with a fairly large sum due at the end of the period. For the purpose of this report, an amortization period of 30 years has been used for a first mortgage loan and 20 years for a second mortgage loan.

It is assumed also that first mortgage loans could be obtained for 65 percent of the total funds needed, and that the rate would be 5 percent. Another 25 percent could probably be obtained on a second mortgage at 6 percent. The remaining 10 percent might be obtained by selling non-dividend-paying stock to tenants.

These assumptions are for illustrative purposes only. Market sponsors should allow for variations in interest rates when financing the project.

Investors may insist that total income of the center organization be substantially larger than the amount needed to pay the debt service charges on the first and second mortgages. Thus, a 10-percent reserve is included in the debt service plan.

The agreement negotiated on the total debt reserve required and the number of years this must be collected by the market organization and held in escrow will depend on the condition of the money market at the time of financing.

Table 15 shows, for the Gulf site, the annual debt service payments required for amortizing the investment costs of land and facilities and for a 10-percent reserve. The annual amortization charge is based on an average of 6.4 percent of the cost of land and facilities. This is the equivalent of 65 percent of the total investment in land and facilities amortized at 5 percent for 30 years, and 25 percent of the investment at 6 percent amortized for 20 years. The remaining 10 percent of the investment would be obtained through stock subscription or other non-interest-bearing sources.

Real Estate Taxes

It is expected that the food distribution center organization will pay taxes on land, buildings, and other taxable facilities at the current rate for city and county taxes on the assessed valuation of the property. Assessed valuation in 1963 was 85 percent of the market value in Springfield, and the tax rate was $47.75 per $1,000 assessed valuation. This is the basis upon which taxes were computed. A 10-percent contingency is provided to allow for possible increases in the tax rate in future years. Estimated annual real estate taxes for each commodity group that would occupy the multiple-occupancy buildings included under the overall market management are shown in table 15.

TABLE 15.—*Estimated annual revenue required for debt service payments, real estate taxes, and reserve funds for the multiple-occupancy buildings on the Gulf site*

Commodity group	Investment cost of land and facilities	Debt service			Taxes		
		Amortization charge [1]	Reserve [2]	Total	Amount [3]	Reserve [2]	Total
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Fruits and vegetables	851. 7	54. 5	5. 5	60. 0	34. 6	3. 5	38. 1
Meat and related products	592. 4	37. 9	3. 8	41. 7	24. 1	2. 4	26. 5
Dairy products and eggs	120. 2	7. 7	0. 8	8. 5	4. 9	0. 5	5. 4
Groceries	2, 075. 0	132. 8	13. 3	146. 1	84. 2	8. 4	92. 6
Total	3, 639. 3	232. 9	23. 4	256. 3	147. 8	14. 8	162. 6

[1] Amortization charge is based on 6.4 percent per year of the investment in land and facilities.
[2] Reserve of 10 percent of amortization charge and taxes.
[3] Taxes are computed on an assessed valuation of 85 percent of cost of land and facilities at a rate of $47.75 per $1,000 of assessed valuation.

Operating Costs

The major operating expenses are salaries for the manager and other employees, fees for special services, rent for an office, publicizing of the market, travel, office supplies, maintenance, fire and property insurance premiums, and refuse and snow removal. In some markets in major cities, separate trade corporations are chartered, but to conserve funds in Springfield, it is expected that associations of common interest will perform certain administrative duties without charge to the food center corporation. Estimates of the operating costs of the center organization are shown in table 16.

Revenue Required

Table 17 shows the estimated annual revenue required to meet debt service charges, taxes, and the facility management costs for the multiple-occupancy buildings included in the plan. As stated earlier in this section, the annual revenue required for land and facilities for the farmers' market, the single-occupancy grocery warehouses, the refrigerated warehouse, and the service facilities is not included.

The revenue needed to support any wholesale food market must be obtained from rentals and charges for the use of its facilities. Monthly rentals for facilities and fees for parking cars and trucks are examples of possible ways of assessing such charges among the users of the market. The management of the market must decide the best way of apportioning the revenue needs among the users.

In the following discussion, it is assumed that the annual income required will be obtained from rentals of the multiple-occupancy buildings that

TABLE 16.—*Estimated annual operating costs of the food center corporation*

Cost item	Cost
Personal services expense:	*Dollars*
Manager	12, 000
Secretary (accounting and typing)	5, 500
Total	17, 500
Salary and wage benefits, 12%	2, 100
Total of personal services	19, 600
Administrative office expense:	
Office rent	2, 500
Travel and per diem	1, 200
Utilities (electric, gas, water, telephone, telegraph)	3, 500
Office supplies	2, 000
Legal, auditing, and other services	3, 000
Insurance (fire and comprehensive, liability, automobile)	250
Miscellaneous	600
Total administrative office expense	13, 050
Other operating expense:	
Sanitation, refuse, and snow removal	6, 000
Maintenance and repairs [1]	25, 700
Fire and comprehensive insurance [2]	2, 080
Liability [3]	440
Miscellaneous	1, 800
Total other operating expense	36, 020
Total expenses	68, 670
Contingency, 10%	6, 867
Grand total	75, 537

[1] ¾ of 1% of investment in facilities.
[2] 80 percent of construction costs of buildings @ $1.15/$1,000.
[3] $1.75/$1,000 for $250,000.

TABLE 17.—*Estimated total annual revenue required, by commodity groups, for debt service, taxes, and management and maintenance of the multiple-occupancy buildings in the proposed wholesale food center on the Gulf site*

Commodity group	Debt service	Taxes	Management and maintenance [1]	Total
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Fruits and vegetables	60. 0	38. 1	16. 6	114. 7
Meat and related products	41. 7	26. 5	12. 7	80. 9
Dairy products and eggs	8. 5	5. 4	2. 4	16. 3
Groceries	146. 1	92. 6	43. 8	282. 5
Total	256. 3	162. 6	75. 5	494. 4

[1] Prorated on the basis of relative value of facilities.

are planned to house 59 independent wholesale dealers, the restaurant, and the offices above the fruit and vegetable building. Obviously, such rentals would be reduced if some of the required revenue is derived from other sources. Table 18 shows the suggested rental schedules based on annual revenue required if the market is built on the Gulf site. The estimated annual rentals needed amount to $498,700.

Rentals per square foot should be the same for identical buildings built at the same time. This suggested schedule of rents would yield slightly more than the annual revenue required if there is 100 percent occupancy of facilities. Although it has been suggested that no facility be built for which there is not a firm lease from a responsible firm, the rental scale should yield some margin above the minimum requirements. The schedule of rents shown in table 18 provides such a margin, plus the contingencies that were considered in computing the total annual revenue required.

TABLE 18.—*Estimated rentals needed, by commodity group or type of facility, to produce the total annual revenue required for the multiple-occupancy building area in a food distribution center on the Gulf site*

Commodity group or type of facility	Floor space	Estimated annual rent		
		Per square foot	Per unit	Total
	Square feet	*Dollars*	*Dollars*	*1,000 dollars*
Fruits and vegetables	61, 425	1. 40	4, 095	86. 0
Meat and related products	77, 400	1. 20	5, 160	92. 9
Dairy products and eggs	10, 530	1. 40	4, 900	14. 7
Groceries	193, 050	1. 40	4, 900	270. 3
Restaurant	2, 925	2. 00	5, 900	5. 9
Offices	10, 500	2. 75	1, 200	28. 9
Total or average	355, 830	1. 40	----	498. 7

ESTIMATED BENEFITS AND COST REDUCTIONS

Measurable Benefits

Estimates of the major cost items for moving 155,100 tons of food commodities received by 59 independent wholesale dealers through the multiple-occupancy facilities in a new wholesale food center are shown in this section. Costs are not computed for the farmers' market, the six dealers who would be tenants in a privately constructed refrigerated warehouse, the dealers in the two single-occupancy grocery warehouses, and the food-chain warehouse; they would plan the construction of their own facilities.

The estimated handling and other costs for the proposed facilities are a composite of costs obtained from new markets in other cities where conditions are comparable to Springfield. These data are used to indicate the savings between the average costs of operations in the existing facilities of the 59 independent wholesale food handlers and in the proposed new facilities.

The marketing costs that would be affected most by improved facilities are (1) cartage, (2) handling, (3) interdealer transfers, (4) spoilage, deterioration, breakage, and shrinkage, and (5) rentals. Although these are not the only marketing costs, they represent the major savings or cost change that would be effected in proposed new facilities.

Cartage

Cartage is the cost incurred in loading and moving products from team tracks and other points of initial receipt to the dealers' stores. In the new facilities the cartage costs would be reduced 77 percent because most rail cars would arrive directly at the dealers' stores. However, some dealers would probably have to pay for cartage of products received in "pool cars" or from local processors. Possible savings in cartage, by commodity, are shown in table 19.

TABLE 19.—*Cartage costs in present facilities of 59 independent wholesalers in the multiple-occupancy buildings in a proposed wholesale food center on the Gulf site*

Commodity group	Tonnage incurring cost		Cost per ton	Total cost		Cost reduction
	Present	Proposed		Present	Proposed	
	Tons	*Tons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Fruits and vegetables	667	330	4. 15	2, 768	1, 370	1, 398
Meat and related products	2, 887	433	3. 90	11, 259	1, 689	9, 570
Dairy products and eggs	11	7	3. 10	34	22	12
Groceries	180	63	3. 70	666	233	433
Total	3, 745	833		14, 727	3, 314	11, 413

Handling

One of the largest areas of potential savings from operating in new, improved facilities would be from increased labor efficiency. The proposed facilities provide for handling commodities in one-story buildings adapted to the use of modern handling equipment, with platforms at rail car level at the rear and at truckbed level at the front. Commodities could be received at the dealer's store at the rear platform from either truck or rail car.

One of the best ways to reduce costs is to use modern materials-handling equipment to move merchandise and to use the unit-load principle whenever feasible. Facilities such as those proposed here are designed to take full advantage of this principle. Commodities received in boxes or cartons could be loaded on skids or pallets in a car or truck or on the platform and moved into the store. Bulk products could be loaded on efficient handling equipment and transported to the display area, coolers, or platforms. Even without such equipment, large savings could accrue because of improved operations and facilities, such as order assembly from pallet racks by the food handlers. The cost reductions in this area have been classified as handling costs, which include flow of commodities through a facility from unloading to loading onto outbound trucks. The total handling costs of $1,503,937, as estimated for the proposed facilities, would be 64.3 percent of the present costs of $2,337,963 (table 20).

Intermarket and Intramarket Transfers

Another area of cost that would show considerable percentage reduction in an efficient wholesale food center would be the interdealer transfer costs. These costs, although necessary, are especially high where there are scattered dealer facilities and a split market. In the proposed wholesale food center, facilities would be reasonably accessible to other dealers, and located in a more compact area than before. This should result in some savings in these marketing costs. These estimated savings amount to $50,342 (table 21).

Reductions in interdealer movement were based on the assumption that the same volumes would be moved over shorter distances. In the proposed food center, much of the interdealer transfers could be effected simply by moving the goods down a platform. The most notable saving in this area would accrue to the wholesalers of fruits and vegetables and meat and related products. The total of such costs is estimated at $85,995 for the proposed food center, or 63.1 percent of the

TABLE 20.—*Handling costs in present facilities of 59 independent wholesalers with those in the multiple-occupancy buildings in a proposed wholesale food center on the Gulf site*

Commodity group	Tonnage incurring cost [1]	Cost per ton		Total cost		Cost reduction
		Present	Proposed	Present	Proposed	
	Tons	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Fruits and vegetables	75, 216	5. 50	2. 05	413, 688	154, 193	259, 495
Meat and related products	66, 805	22. 45	15. 72	1, 499, 772	1, 050, 175	449, 597
Dairy products and eggs	10, 503	6. 10	4. 50	64, 068	47, 264	16, 804
Groceries	48, 058	7. 50	5. 25	360, 435	252, 305	108, 130
Total or average	200, 582	11. 65	7. 50	2, 337, 963	1, 503, 937	834, 026

[1] Includes direct receipts plus intermarket and intramarket transfers.

TABLE 21.—*Intermarket and intramarket transfer costs in the present facilities of 59 independent wholesalers and in the multiple-occupancy buildings in a proposed wholesale food center on the Gulf site*

Commodity group	Tonnage incurring cost [1]	Cost per ton		Total cost		Cost reduction
		Present	Proposed	Present	Proposed	
	Tons	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Fruits and vegetables	18, 016	3. 25	1. 95	58, 552	35, 131	23, 421
Meat and related products	19, 058	2. 85	1. 85	54, 315	35, 257	19, 058
Dairy products and eggs	1, 803	2. 40	1. 70	4, 327	3, 065	1, 262
Groceries	6, 601	2. 90	1. 90	19, 143	12, 542	6, 601
Total or average	45, 478	3. 00	1. 89	136, 337	85, 995	50, 342

[1] Tonnage subject to intermarket and intramarket transfers assumed to be the same as in present facilities.

$136,337 in existing facilities of 59 wholesale dealers who would probably move to multiple-occupancy buildings.

Spoilage, Deterioration, Breakage, and Shrinkage

Spoilage, deterioration, breakage, and shrinkage should be substantially reduced in a new wholesale food center because it would no longer be necessary to store perishable commodities outside. Pilferage would be reduced. With less handling required, there would be considerable reduction in breakage, bruising, and subsequent spoilage. It is estimated that wholesalers would save about $186,000 from this source, as may be seen in table 22. Substantial savings would accrue to all of the groups of food dealers. Estimated losses in the proposed food center, $432,547, would be 69.9 percent of present losses of $618,918.

Rents

Rental charges would be increased for grocery wholesalers in the proposed food center. However, this increase would be partially compensated through the reduction of other costs. The sum of the rents would be higher because the new food center would contain commodious facilities and services not now generally available to Springfield food handlers, and because building costs are higher than when the present buildings were constructed. Increased rent is the price that must be paid for reductions in other costs, improved working conditions, an improved competitive position, and more space. For the most part, the increased rental for grocery facilities is due to the space provided for longer storage of products. Rents would be decreased for independent wholesale dealers in fruits and vegetables, meat and related products, and dairy products and eggs, as shown in table 23.

Comparison of rents charged when this study was made with rents in the new wholesale food center indicates that rents would increase $123,476, which would be about 36 percent greater than the present rents.

Summary of Measurable Costs

The total costs estimated for the 59 independent wholesale dealers in the proposed food center would amount to about $2,489,693, a cost reduction

TABLE 22.—*Spoilage, deterioration, breakage, and shrinkage costs in the present facilities of 59 independent wholesalers in the multiple-occupancy buildings in a proposed wholesale food center on the Gulf site*

Commodity group	Tonnage incurring cost [1]	Cost per ton		Total cost		Cost reduction
		Present	Proposed	Present	Proposed	
	Tons	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Fruits and vegetables	75, 216	2. 55	1. 15	191, 800	86, 498	105, 302
Meat and related products	66, 805	5. 00	4. 20	334, 025	280, 581	53, 444
Dairy products and eggs	10, 503	2. 00	1. 20	21, 006	12, 604	8, 402
Groceries	48, 058	1. 50	1. 10	72, 087	52, 864	19, 223
Total or average	200, 582	3. 09	2. 16	618, 918	432, 547	186, 371

[1] Includes total receipts plus intermarket and intramarket transfers.

TABLE 23.—*Rentals in the present facilities of 59 independent wholesalers in the multiple-occupancy buildings in a proposed wholesale food center on the Gulf site*

Commodity group	Space used		Rent		Rental difference
	Present	Proposed	Present	Proposed	
	Sq. ft.	*Sq. ft.*	*Dollars*	*Dollars*	*Dollars*
Fruits and vegetables	125, 140	[1] 61, 425	89, 504	[1] 86, 000	−3, 504
Meat and related products	189, 050	77, 400	150, 860	92, 900	−57, 960
Dairy products and eggs	38, 350	10, 530	31, 900	14, 700	−17, 200
Groceries	124, 065	193, 050	68, 160	270, 300	+202, 140
Total	476, 605	342, 405	340, 424	463, 900	+123, 476

[1] Does not include the restaurant and the office space over the wholesale stores.

of $958,676 from present costs (table 24). The cost reductions are not the same for all commodity sections. The meat and related products section could reduce costs $589,629, but the groceries section's costs would be increased $67,753, or 13 percent. Table 24 shows costs of existing and proposed multiple-occupancy facilities for the 59 wholesalers, and the possible savings that would ensue.

Nonmeasurable Benefits

In addition to measurable benefits, there are numerous benefits which are not readily measurable. Nonmeasurable benefits would accrue not only to wholesale food dealers, but also to others interested in the food center.

Wholesale dealers could benefit through savings in time of salesmen, an increased volume of business by improved capacity, service, and expanded transportation, and in general, better working conditions. Better operations and facilities in a new wholesale food center could improve their prestige. Many of the defects of the present facilities, as enumerated earlier, that could be corrected in a wholesale food center are not measurable. Sacrifice sales because of an excess of commodities could be reduced by refrigerated storage. Such items as lack of rail spurs could be partially reflected in unnecessary cartage costs, and inconvenience and delay in having to move a crew from the store to unload packages from a rail car on the team tracks adds to the nonmeasurable costs. Losing sales through inability to serve customers properly is also a possibility. Even defects such as lack of adequate facilities for employees' comfort, or insufficient employee parking, while unmeasurable, could certainly be reflected in employee morale and, thereby, in work efficiency.

Buyers using the proposed wholesale food center could expect to profit in various ways. Since they would no longer need to visit several market areas, buyers would be better informed regarding prices and supplies. The master plan for the market provides for wide streets with adequate parking and good loading facilities, which would reduce the time necessary for trucks and other vehicles to approach and depart from facilities.

The railroads serving the present markets are at some competitive disadvantage in handling many commodities because many dealers are not served by direct rail spurs. When shippers compare the cost involved in shipping by truck with that by rail (with the additional cost of cartage

TABLE 24.—*Summary of estimated costs and possible savings in a proposed food center on the Gulf site and present costs of 59 independent wholesalers*

Commodity group	Costs		Ratio of proposed costs to present costs	Savings
	Proposed	Present		
	Dollars	*Dollars*	*Percent*	*Dollars*
Fruits and vegetables	363, 192	756, 312	48. 0	393, 120
Meat and related products	1, 460, 602	2, 050, 231	71. 2	589, 629
Dairy products and eggs	77, 655	121, 335	64. 0	43, 680
Groceries	588, 244	520, 491	113. 0	−67, 753
Total	2, 489, 693	3, 448, 369	72. 2	958, 676

for rail shipments), they often decide in favor of shipment by truck. In the new food center rail spurs would be provided to permit direct unloading at the dealers' stores.

Farmers could expect savings and benefits that are not immediately self-evident. The new facilities would give them a convenient central location for sales of farm products and continued selling during inclement weather. Because of the proximity of the farmers' market to the wholesale dealers, producers would not need to rely greatly upon retailer purchases of their products; they could, therefore, spend less time on the market by transferring greater quantities to wholesalers.

If present highway and redevelopment plans materialize, most of the present wholesale food dealers will be forced to find new stores or go out of business. A wholesale food center would provide a desirable area and business climate for such relocations. Not only would a modern wholesale food center minimize the cost of new facilities for specific dealers, but it would also enable them to maintain or improve their competitive position among wholesale food dealers in nearby cities.

CONCLUSIONS

This study of the food marketing places and practices in Springfield and vicinity led to the conclusion that it is economically feasible to construct a modern wholesale food distribution center as a regional market for Springfield to replace the present inefficient and outmoded facilities, and that groups and individuals would benefit thereby.

Such a regional market would be feasible if (1) it is built at a convenient location with unrestricted receiving and distribution; (2) the facilities to be included, the amount of land needed, and the requisites for the site are in accordance with the findings of this study and caution is used in scheduling construction of buildings and occupancy of proprietors who would move in now or later; (3) a master plan is prepared and adopted at the outset, so that the first buildings constructed will not interfere with the full development of the center; (4) plans are coordinated with plans of the City Planning Board, including plans for redevelopment of blighted areas, future location of major expressways and other transportation arteries, and other facilities now planned or under construction; and (5) an effective sponsoring group is established to implement the findings of this study.

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